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CONTENTS

PEOPLE'S REPUBLIC OF CHINA

I. GENERAL INFORMATION

National

Questions on Forecasting, Prevention of Floods Explored
(Hua Shiqian; ZHONGGUO SHUILI, No 3, 1982).................. 1

'GUANGMING RIBAO' on PRC Agricultural Strategy
(GUANGMING RIBAO, 7 Nov 82)................................ 14

PRC Peasants' Purchasing Power Increases
(XINHUA Domestic Service, 15 Nov 82)........................ 18

Methods of Sowing Wheat in Furrows Explained
(Li Jiwu; NONGYE KEJI TONGXUN, 20 Sep 82).................. 19

Revised Formula for Calculating Seed Needs Explained
(Chen Zhenming; NONGYE KEJI TONGXUN, 20 Sep 82)............ 22

Double-Contract Economic System
(Zhang Guangyou; GUANGMING RIBAO, 31 Oct 82)............... 24

PRC's Wang Wei Explains Food Hygiene Law
(XINHUA Domestic Service, 12 Nov 82)........................ 29

Rural Agricultural Responsibility System Praised
(GUANGMING RIBAO, 7 Nov 82)............................... 31

Briefs
Fall-Winter Planting Stepped Up 33

Anhui

Abandonment of Continuous Rice, Wheat Cropping Urged To Increase Yields
(Xu Huandou; NONGYE KEJI TONGXUN, 20 Sep 82)............. 34

Briefs
Wheat Sowing 38
Flood Victims 38

Fujian

Briefs
Marine Fish-Farming 39
Sea Fish Farming 39

Gansu

Briefs
Grain Production Forum 40
Hexi Area Forum 40

Guangdong

Briefs
Hainan Sugarcane Production Conference 42

Hebei

Success of Fertilizer Experiments Reported
(Hebei Ribao, 18 Sep 82)................................. 43

Briefs
Thermal Water Resources 45

Heilongjiang

Circular Issued on Stopping Reckless Tree Cutting
(Heilongjiang Provincial Service, 6 Nov 82)............. 46

Briefs
Natural Resources 47

Henan

Briefs
Wheat Sowing 48

Jiangsu

Briefs
Hog Raising 49

Jiangxi

Briefs

Tea Oil Production 50

Jilin

Briefs

Grain Procurement 51
Oil-Bearing Crop Procurement 51

Nei Monggol

Briefs

Cattle Export 52
Sheep's Wool 52
Beet Output 52
Beet Harvest 52

Ningxia

Autonomous Region Increase in Summer Grain Reported
(NINGXIA RIBAO, 18 Sep 82)................................ 53

Shaanxi

Conference on Winter Agricultural Production
(Shaanxi Provincial Service, 7 Nov 82)................... 54

Briefs

Tangerine Output Conference 56
Means of Production 56

Shandong

Masses Reassured on Agricultural Policy
(Shandong Provincial Service, 7 Nov 82).................. 57

Dezhou Prefecture Readjusts Crop Distribution
(BEIJING RIBAO, 23 Sep 82)................................ 58

Soil Conservation Work Conference Ends 4 November
(Shandong Provincial Service, 4 Nov 82).................. 60

Briefs

Mechanized Farming 62
Wheat Sowing 62
Wheat Planting 62

Shanghai

Briefs

Diversified Economy 63

Shanxi

Meeting on Water, Soil Conservation
(Shanxi Provincial Service, 9 Nov 82).................... 64

Preliminary Successes in Hexaploid Cotton Hybrids Reported
(Li Bing Lin, et al.; NONGYE KEJI TONGXUN, 20 Sep 82).... 65

HONG KONG MEDIA ON CHINA

'WEN WEI PAO' on Hu Yaobang's Visit to Liangshan
(WEN WEI PAO, 17 Nov 82).................................. 68

ABSTRACTS

ATOMIC ENERGY APPLICATIONS

YUANZINENG NONGYE YINGYONG [APPLICATION OF ATOMIC ENERGY IN AGRICULTURE], No 3, 17 Sep 82............................. 69

BIOLOGY

SHIYAN SHENGWU [ACTA BIOLOGIAE EXPERIMENTALIS SINICA], No 3, Sep 82.. 73

FORESTRY

NANJING LINCHAN GONGYE XUEYUAN XUEBAO [JOURNAL OF NANJING TECHNOLOGICAL COLLEGE OF FOREST PRODUCTS], No 3, Sep 82....... 75

PLANT, ANIMAL RESEARCH

SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES], No 10, 20 Oct 82)... 78

VETERINARY SCIENCES

XUMU SHOUYI XUEBAO [ACTA VETERINARIA ET ZOOTECHNICA SINICA], No 3, Aug 82.. 81

I. GENERAL INFORMATION

QUESTIONS ON FORECASTING, PREVENTION OF FLOODS EXPLORED

Beijing ZHONGGUO SHUILI [WATER CONSERVANCY IN CHINA] in Chinese No 3, 1982 p 20

[Article by Hua Shiqian [5478 1102 0051] of the Nanjing Hydrological Research Institute of the Ministry of Water Conservancy and Electric Power: "Problems That Should Be Noted in Actual Forecasts for the Prevention of Floods"]

[Text] (I) The Quantitative Problem in Hydrological Science

Half a century ago, hydrology was basically a branch science that had just emerged from earth science. It mainly described hydrological phenomena. As the need for calculating flood waters in designing large water conservancy projects and for forecasting floods to prevent flooding of important rivers arose, hydrology began to develop quantitatively. Today, quantitative calculations in hydrology can preliminarily satisfy the requirements in design and in flood prevention, but its precision is not high compared to other quantitative sciences. During the latter part of the 1960's, the use of computers in the field of hydrology became widespread. Many hydrological models were developed. The efficiency of computation was improved, but the improvement in precision was still limited. This was because of the following reasons:

1. The limitations of input of information of hydrological systems

Our nation suffered mainly from floods due to rain. The amount of rainfall is the main piece of information of a hydrological system. How large an area of rain can a rain meter really represent? This question is difficult to answer. Sampling tests taken from stations of the existing network of rain measuring stations show that the gradient of rainfall in the plains is small. Within an allowable range of error, it can represent a larger area. The gradient of rainfall in the mountain regions is larger and the area it can represent is smaller. The southeast coastal region is generally a complete region of rainfall. The area represented can be larger. Rainfall in the northwest is frequently distributed in patches. The area that can be represented is very small. I have had contact in the past with the Beiyishui Chongling Runoff Experimental Station at the eastern foot of Taihangshan in Hebei Province. Taking it as an example, seven rain guages were set up within the small river basin with an area of only 50,000 square meters. The difference between the maximum and the minimum amount of rainfall, measured after one rainfall, generally reached 5 percent and the difference between individual rainfalls reached 13 percent. Of course, the strike of the mountain slopes in this small river basin had a relatively large turn, and this might have enlarged the gap of the difference. But the density of the rain measuring stations in large river valleys is much lower, and we can conclude that the error and the difference contained in the measurements of rainfall themselves are not too small. The measuring of the torrential rains in the northwest may show an even greater error and difference. Such input errors are not easily adjusted by computational methods. When reflected in the output, the improvement in precision of hydrological forecasts is limited. The precision in measuring the flow in small rivers is also limited by conditions. Because the slopes are steep and the flood waters rise and fall quickly, and if the period of measuring the flow cannot be easily shortened, then the measurement made from one bank to the opposite bank would not be the sum of the individual parts of the flow of each sectional area measured at the same time. Moreover, the error and the difference also cannot be neglected even when measurement is taking place instantaneously as the entire section of water flow occurs. The precision in measuring the flow of large rivers is generally higher, but there are exceptions, for example, in the river segments at the middle and lower reaches of the Huanghe, because certain sections are too wide, and the measuring of flow requires several hours. With the unstable silting in certain sections of the flood, the direction of the main flow frequently shifts, thereby reducing the precision of the measuring of the flow. Therefore, even if the effects of human activity are not taken into consideration, the error and the difference in the information on natural river valleys further limit the improvement in calculating precisely the hydrological quantity.

2. The limitations of the methods of hydrological calculations

Over the past 20 years and more, the theory and methods of hydrological calculations have improved. Generally speaking, the study of the laws that govern the motion of bodies of water in a river valley is a problem in hydrodynamics. Calculations of the generation of flow and confluence are all limited by the Sheng Weinan [5110 4850 0589] differential equations. In the past, the Sheng Weinan equations were very difficult to solve. Now, with the help of the computer, they can be completely solved. But the parameters in the Sheng Weinan equations and the boundary and initial conditions vary according to time and place in the river valley. In practice, frequently data of many measurements must be gathered to select the best measurements to determine the parametric values. This limits further improvement of the precisions of calculations. During the past 20 years, new models for the generation of waterflow and confluence have been proposed continuously, but the precision of calculations has not been greatly improved. This is because the structure of the models is often simplified while the actual situation is much more complex. The major factors affecting the dynamic variation of bodies of water and variations in time and space, can only be generalized using statistical methods at present. Of course the precision is limited. When limiting values beyond the range of the known data are encountered, it is more difficult to guarantee the precision of calculations. In general, the established model used for forecasting at present includes the objectively existing randomness of the elements of input and the lower cushioning surface within the space of the river valley, and there is great difficulty in further improving their precision.

3. Estimates of the effects of human activity are rough

As productivity develops, the ability of mankind to influence nature and the environment becomes greater. The effects of water conservancy and water conservation projects upon the various elements of hydrological cycles are the most visible [examples] of this. They should be given full consideration and they should be quantitatively estimated as much as possible.

The current research level indicates that qualitative judgment can be made of the changes on the surfaces of slopes in river valleys, but it is very difficult to make quantitative estimates of higher precision. For example, changes in vegetation on the surfaces of slopes will cause corresponding changes in the granular structure of the soil and this will benefit infiltration of water. The increase in coarseness of the surface of a slope will reduce the speed of flow on the surface of the slope and increase the duration of infiltration from the surface of the slope. Changing the surface of the slope into platform terrace fields and building ridges around the fields will similarly delay runoff and increase infiltration. Because the amount of construction on the surface of the slope is large, the distribution on the surface is not even, therefore, it is not practical to calculate its influence on the macrocosmic river valley precisely. Generally, we can only rely on empirical data to develop a rough estimate. Construction projects on river channels, such as reservoirs, river floodgates, flood water sluice gates or diversion sluice gates have a relatively stable relationship in hydraulics. We can use more mature hydraulic and hydrological methods in calculations and the precision is higher. But in actual forecasting, we still need to acquire all information regarding the projects on the river channels described above in time before we can carry out relatively more precise calculations. If there are many construction projects in the river channels in the river valley, and if we can only obtain information concerning a portion of the projects, then we can only make estimates.

A summary of the three points above shows that further improving precision involves the three aspects of information input (the network of stations), computational method and human activity. Therefore it is very difficult. It is very important to clearly recognize this point. On the one hand, blindly believing the forecasts and believing that every water level that has been forecast will surely be reached without even one centimeter of error and thus neglecting the problem of precision in quantitative calculations, a problem that commonly exists in earth sciences can be avoided. On the other hand, complete distrust of hydrological forecasting and regarding it as a theoretical science and disregarding it completely can also be avoided. Only by correctly understanding the precision of quantitative hydrological forecasts can we correctly use the forecasts and avoid causing unnecessary loss.

(II) Becoming Familiar With the Weather, Flooding and Natural Geographic Characteristics of the River Valley Can Prevent Serious Mistakes in Actual Forecasts

The forecasting plan is the most important tool in forecasting. This view is generally accepted. But, can we acquire the initiative in preventing floods and guarantee that our forecasts will not be seriously wrong by relying only on the forecasting plan? The answer is not affirmative. In special situations, simply relying on the forecasting plan will not completely avoid serious mistakes. Also, if we disregard the problems that might exist when drawing up a forecasting plan, at least in the many forecasting plans that have already been established, we cannot completely reflect the effects of weather, flooding and natural geographic characteristics of the river valley. Therefore, if the forecaster does not possess a profound knowledge of the above characteristics of the river valley, and if he relies only on the forecasting plan to make his forecasts, it is very possible that he will not avoid making forecasting errors while seizing the initiative in his work and while encountering special conditions that have occurred. The following examples will explain this.

1. Understand the characteristics of torrential rains in the river valley and seize the initiative in flood prevention

First we must understand the seasons in which torrential rains occur in the river valley. For example, torrential rains generally occur between the beginning of July and the middle 10 days of August in ordinary years in the Huaihe river valley. But the earliest occurrence of floods due to torrential rain is at the beginning of June. At this time, wheat planted on the river beaches has not been harvested yet, and when torrential rain falls, a labor force must be organized before the flood water floods the beaches to harvest wheat in time. This creates a tense situation. Therefore, starting from the beginning of June, flood prevention forecasters must watch the movement and development of rainy regions south of the Changjiang closely to seize the initiative in flood prevention. Also, for example, after the middle 10 days of August, the possibility of occurrence of large floods in the entire river valley is very remote but the threat of typhoons to Shandong and the northern coast of Jiangsu still exists. Especially in Yishu River, only several hours after a torrential rain, flood peaks will occur in Linyi and Danguanzhuang. When the floodwater surpasses the safe amount of downstread discharge, the sluice gate at Jiangfenkou must be used, the waterflow of the Yi River must be diverted into the Shu River, and the sluice gate on the Xinshu River must be used. To seize the initiative in flood prevention, the movements of a typhoon over the Pacific, the possible landing routes and the possibility that the typhoon will change to a tropical low pressure system and move into the Yi-Shu river valley must be closely monitored during this period to strengthen flood forecasts and preparatory forecasts. This way we will avoid being caught unprepared when torrential rains fall because we have let down our guard during the latter period of flooding.

2. Understanding the characteristics of flooding in river valleys is useful in revising forecasts and improving accuracy

By analyzing the water of large and small floods pouring into a river valley, we can understand the characteristics of the fullness or leanness of the peaks, variations in the time of propagation of the floodwaters, regulation and interference of floodwater in the main streams and tributaries, the characteristics of deformation, the rise and fall of water roping during the course of downstream discharge of floodwaters in river channels, the regulatory and storage functions of natural lakes and lowlands, and the characteristics of the tidal effects at river mouths. They all have a great reference value for revising actual forecasts, and sometimes may play a key role. Take the southern Canal before 1963 as an example. The safe discharge of the river channel from Chenggouwan to Dezhou dropped from 1,100 cubic meters per second to 400 cubic meters per second. The capability of the river segment for passage of floodwater becomes smaller downstread, creating blockage. This is more pronounced when floodwater continues to flow. The relationship between the water level and the volume of flow at each of the corresponding stations along the river has been shown to be opposite the looping effect in ordinary river channels, and looping of follow-up floodwaters is even greater. The relationship between trough storage and the volume of flow also shows corresponding looping changes, but forecasting plans consider only changes in the rise and fall of water to derive the parameters of the floodwater. This is the average value of the slope of the looping floodwater over the years. The precision is not high.

But how can we estimate looping changes for the next flood? That depends on a profound understanding of the characteristics of the flood water in the river segment and the experience acquired in past forecasts to correctly estimate looping changes. The precision of forecasting can visibly improve. It can be seen that a profound understanding of the characteristics of floodwater in the river segment or the river valley is a precious treasure of a mature forecaster. It is also a necessary preparation to avoid major forecasting mistakes.

3. Understanding the natural geographic characteristics of the river valley is also an important apsect of a successful forecaster

The elements taken into consideration by a forecasting plan are mostly elements that are directly related to the movement of the bodies of water. The plan only describes in general the natural geographic characteristics of the river valley, such as vegetation, soil, the shape of the river valley and the fall of the slope, the density of the river network, the section of the river channel and the specific fall, the lakes and beaches of river troughs, ground surface erosion (including slipping slopes during the rainy season). Generally they are not the major parameters used in quantitative calculations in the plan.

Under ordinary conditions, the effects of natural geographic factors are relatively stable in the river valley, but under special conditions, the effect of a certain factor may be very large. At this time, simply relying on the forecasting plan may cause mistakes in forecasting. For example, there is a relatively wide natural flood detention basin at the mouth of the Zhanghe where it emerges from the mountain. Each year after the flooding period begins, water of the first big flood pours into the flood detention basin, and nearly 10 million cubic meters of water are lost. If this situation is not understood and if it is not handled in a special way, the forecast of the first floodwaters may very possibly be over estimated and cause a scare. Also, for example, if several rains had already fallen during the early period of the year in the loess plateau region at the middle reaches of the Huanghe and if such rains were followed not long afterwards by torrential rains, then large slides might easily occur. This would greatly increase the sand content of the flood waters. The peak of such mud flows is a combination of the peak of clear flood waters and the peak of mud flow. If the forecasting plan is drawn up from the data of flood waters having a low sand content, generally speaking, the forecast value will be smaller. The above shows that in actual forecasting, it is necessary to be familiar with the natural geographic characteristics in the river valley.

A summary of the three above points shows that to guarantee the precision of actual forecasting for flood prevention, besides drawing up a good forecasting plan, we still need to be familiar with the weather, flooding and natural geographic characteristics of the river valley before we can seize the initiative and prevent mistakes.

(III) The Effects of Water Conservancy and Water Conservation Projects Upon the Flood Water in the River Valley Must Be Fully Understood

1. In forecasting for river segments, we must first understand the ability of the embankments of each river segment to discharge the flood water and the dangers of unsafe sections of embankments at different water levels. The amount of flow over the flat beaches must be understood. To guard against large flood waters, we must understand the amount of flow over level embankments, and we must understand the situation of water blocked by bridges where there are bridges. In river segments where sectional scouring and silting changes are larger, we must understand the situation of sectional scouring and silting, the shift of the main flow, the horizontal specific fall, the intersections of the main flow and structures in the water such as bridges at a high water level. The flood discharge ability of the embankments can be determined by analyzing the water surface lines of past floods and the curve of the relationship between the water level and the amount of flow at each station within the river segment. The lowest and the average water levels causing danger in the river segment can be derived by studying dangerous situations of the embankment which occurred at different water levels of past floods. Knowledge about the amount of flow over flat beaches is mainly used for seizing the time to harvest crops planted on the beaches. The knowledge about the amount of flow over level embanknents is used generally to calculate the maximum downstream discharge the enbankment may possibly bear after elevating the secondary low banks between fields. Water blocked by bridges may dam up the upstream water level. We can use hydraulic or hydrological methods to calculate the difference between the upstream and downstream water levels. In river segments with dynamic river beds where the sections change drastically,

the direction of flow of the trunk water flow and the bridge do not intersect at right angles and thus the amount of downstream discharge is reduced. The amount of downward discharge at the time the direction of flow changes and the water surface line of the upstream backwater section can be calculated by hydraulic or hydrological methods.

2. The effect of medium and small (I) reservoirs on the tributaries upon the regulation, storage and discharge of flood waters. Generally, we can understand the situation of the flood waters entering the reservoir, the water level in the reservoir and the discharge from flood forecasting radio stations or telephone reports, and thus understand their clipping function in the course of the flood. Because of improper use, some reservoirs have to increase the amount of downstream discharge of continuous floods to guarantee the safety of the large dam. We must also consider this unfavorable effect. For medium reservoirs with a reservoir capacity over 10 million cubic meters, we must first calculate the amount of overflow of water over the dam at various high water levels. For earth dams, we should generally estimate its gradual downward shearing and enlargement of the sluicing mouth to derive the amount of flow of the peak of the flood that will cause the dam to collapse. For concrete dams, we should generally consider the use of the formula for calculating the instantaneous collapse of the dam. After calculating the flow line of the amount of flow that will cause the dam to collapse at the dam site, we then derive the amount of flow at the peak of the flood water and the flow line of the water reaching a certain town in the hydrological section. In this way, when a certain reservoir shows signs of danger and may possibly burst, we can find the amount of flow of the peak of the flood at the town downstream when the dam collapses by how fast the water level of the reservoir rises and this information can be used by flood prevention departments.

3. We must understand at all times the amount of water diverted along the river and the situation of diverting water from other river valleys to revise the forecasts.

During the 32 years since the founding of the nation, many diversion projects have been built on rivers. Some rivers have both diversion projects on the rivers themselves and diversion projects that span several river valleys and divert water from other river valleys. General diversion projects all have manually controlled floodgates or natural diversion weirs at the diversion point. The amount of diverted water of the single tunnel (or single width) and its relationship with the water level can both be derived using hydraulic formulas and their coefficients can mostly be determined by experiment using models. If hydrological stations have been set up downstream from the sluice gate weir and if there are hydrological testing data, then the coefficients can be approximately determined, and their precision can be more reliable. The flood prevention and forecasting departments must grasp these data and draw the relationship between it and the water level of nearby hydrological stations for future use. When water is diverted from other river basins, the predetermined diversion points that span river basins should be made in the flood reports. The mouth of the diversion conduit should be made the outflow and the opening of the other river basin should be made the inflow, and the forecast should be revised whenever possible according to the data provided by the flood reports. For example, the Tuhe and Maxiahe river valleys inside Shandong Province frequently diverted water from the Huanghe for irrigation. When torrential rains occur as the water of the Huanghe is being diverted to the river basin, although the gates are immediately shut down, the amount of water that had already been diverted into the river troughs of the river valley, the variation of the water content in the soil within a fixed area of both sides of the diverted river channel and the rise of the underground water level caused by the diverted water should still be calculated. These effects must be considered in time before we can correctly forecast flood waters from the torrential rain in the valley basin.

4. The characteristics of the flood-diversion area must be grasped.

The flood-diversion area that has been determined in the flood prevention plan and that has intake and outflow control floodgates, such as Changjiang's Jinjiang flood-diversion area, mostly has complete information such as the water level both upstream and downstream from the intake floodgate, the curve of the relationship between the height of the opening of the floodgate and the amount of the incoming flood water flow, the curve of the relationship between the water level and the volume of the flood-diversion area and the water level both upstream and downstream from the discharge floodgate, the curve of the relationship between the height of the opening of the floodgate and the amount of the discharged flood water flow. They can basically satisfy computational needs. But, when we encounter especially large flood waters and have to temporarily open up a flood-diversion area, such as the People's Embankment in the Jinjiang section where there are no controlling floodgates and where temporary embankments have to be set up to divert the flood water, the embankments downstream frequently have to be removed to allow the flood water to discharge into the main trunk [sic] river again and to temporarily become a flood water lake during the latter part of diverting the flood waters. When such a temporary flood-diversion area diverts the flood water, the flow of the diverted flood water must be calculated by the flood prevention department. By so doing, the department must understand the conditions under which the water passes through the floodgate such as the width and the average depth of water at the gate, the water level behind the embankment. Then the specific fall of the downstream water surface at the mouth of the trunk flow is used to calculate the amount of water flow of the downstream discharge. By comparing this with incoming water upstread we can check the amount of flow of the diverted waters at the gate. The coefficient of the corrected formula for the flow over the weir can be used to calculate the amount of flow of the diverted waters at the funnel mouth of other embankments in the river segment. The corresponding interior water level in the area of water accumulation inside this temporary flood-diversion area can be found on the map. This is the initially derived water level inside the flood-diversion area. Then we can calculate the interior water level at the end of each period, determine the exact moment when the normal free flow changes to flood, and plot the course of the flow and volume of the incoming flood waters that are gradually diminishing at the time of diversion. We can then determine when is the appropriate time to discharge the water downstream in the flood-diversion area.

5. Outlet control gates and their impact in river channels

The outlet control gates in river channels regulate the release of water to prevent flooding and to store water for drought resistence. At present, gates have been built in many river streams. Because most efforts before the arrival of big torrential rains are to resist drought, therefore, the use of controlling gates in river channels is a factor that cannot be neglected. Let us set aside temporarily the issues of anti-flood management and organization. The forecasters involved in the work of flood prevention, should familiarize themselves and grasp the designs and data materials of these in order to cooperate and utilize these gates correctly. For example, the conditions are laid out in the design on the amount of flood discharge, the corresponding water level and the fall upstream and downstream of the operating gates, the maximum operating head of the gates and the surplus flow exceeding the level of discharge when the water floods over the gates, determination of the downstream flooding area when the embankments on both sides burst, and the relationship between the water level upstream of the operating gate when the gate closes, and the amount of water stored in the river channel. These data not only are needed in revising flood forecasts, they are also necessary in further modifying the forecast. When making actual forecasts, we must especially pay attention to the inspection and the testing of the discharge coefficient of the operating gates when the water level is high (ordinary floodgates lack the capability to determine the discharge rate for high water portions). Only after grasping these key data, can we gradually make more reliable forecasts of river segments that have floodgates.

6. The effects of large key water conservancy projects

The data on large key water conservancy projects on river channels are relatively complete and there is a network of flood reporting stations especially set up for them. For example, Sanmenxia on the Huanghe, Dahuofang on the Hunhe, Guangting Reservoir on the Yongdinghe generally do not have many problems with gathering information and forecasting. The key is to control the flood waters that have discharged into the downstream areas and to handle any possible continuous flood water that may occur upstread. The plans for discharging the flow is calculated from the forecasts of incoming water into the upstream and downstream areas. The safety of the large dam must be guaranteed and the downstream discharge must be controlled to prevent any damage to the downstream area by discharging flood waters. Even when damage is unavoidable, we must still propose the most rational discharge plan to lessen the damage by flood waters as much as possible. According to the discharging plan, we can synchronize the information on flood in all areas to forecast the course of flood waters at all of the downstream places.

7. The effects of small surface water conservancy and water conservation projects

Generally, surface projects do not have a source of information during the flooding stage, therefore, there can only be rough estimates. The effect of surface projects on slopes can only be estimated by analyzing the hydrological data of a year ago or several years ago, and the information is used to revise the forecasting plan. The amount of water at the bottom of small (II) reservoirs or large ponds or dams that are widely distributed is different before the occurrence of each flood from torrential rain, and the situation of every small (II) reservoir is also very different, therefore it is very difficult to estimate. When there are many small (II) reservoirs in a river basin that is seriously damaged by flood, only a portion of these small reservoirs has flood reporting conditions. In this situation, it is necessary and also possible to estimate the effect. There are many methods of estimation. This writer had mentioned one method in an article published in the SHUILI XUEBAO [WATER CONSERVANCY JOURNAL] of October, 1959. We should clearly survey all of the small surface stations in the river basin and their controlled water level during the flooding period and the reservoir capacity to prevent flooding, and the relationship between the height of the dam and depth of the water in the reservoirs and the amount of discharge. Then we should generalize them as one reservoir and derive the relationship between the average depth of water and the total reservoir capacity for flood prevention, and the relationship between the average depth of water and the total amount of discharge. With these relationships, we can develop computations for the reservoir by combining these relationships with the relationship between rainfall and runoff. But when rainfall is heavy, we should also compare the amount of torrential rainfall and the capacity of the reservoir in order to take measure against floods and estimate the amount of flow from small (II) reservoirs that might burst and from dams that might collapse.

Water conservancy projects do affect floods to varying degrees in rivers in the eastern half of our nation. It is not wise to completely neglect these factors. Under present conditions, an overall understanding of the projects within the river valley, making necessary estimates according to hydraulic and hydrological data gathered and according to a portion of the real-time information to revise forecasts will help us avoid making major errors in forecasting.

(IV) Flood Forecasting Must Be Combined With Flood Dispatching In Order to Better Perform the Task of Flood Prevention.

Simply forecasting floods does not serve a great function when especially large floods are encountered. This is because when such situations occur, frequently, the ability of the existing embankments to discharge floods has already been surpassed, and we must take the initiative to separately discharge a part of the flood water and sacrifice a smaller flooded area in exchange for victory in overall flood prevention. We must combine forecasting with the dispatching of floods before we can realize greater results. To facilitate understanding, we will take the actual case of preventing the big flood of the Changjiang and Huaihe in 1954 as an explanation.

1. Changjiang: During the last 10 days of July, 1954, diversion had already taken place in the Jinjiang flood-diversion area. At the time, the peak flood had already passed. The north floodgate at Taipingkou (intake floodgate) was still open to continue to take in flood waters. The reason that we did not dare to close the floodgate was that the downstream water level at Jianli

was level with the top of the embankment and we were building a secondary low bank between fields for fear that after the floodgate closed, the water level would rise. But, August and September are the time when the Chuanjiang brings water, and the chance of the greatest flood of the year occurring in August is the highest in the Chuanjiang. At this time, the remaining capacity in the Jinjiang flood-diversion area was already very small, and we had to close the intake floodgate and use the south floodgate (the discharge floodgate) to drain the water from the Huduhe into Dongting Lake, so that the empty part of the reservoir would have room to receive the Chuanjiang flood waters in August. But, would the Jianli water level rise after closing the north floodgate? We conscientiously analyzed and studied and discovered that the water level at Jianli was higher than the corresponding water levels at Shashi and Jianli by several meters under ordinary conditions. The water level was mainly controlled by the water level at Lingji, the town at the eastern mouth of Dongting Lake (representing the water level of the large body of water), while the water in the four rivers leading into Dongting Lake was receding. The incoming water from the four river mouths had already stabilized. The amount of stored water in the entire Dongting Lake and the eastern Dongting Lake area had reached the maximum value (about 34 billion cubic meters and 16.8 cubic meters). Therefore, closing the north floodgate to divert the flood waters at Jinjiang would not cause the water level at Jianli to rise. A decision was made at a departmental meeting to notify us to immediately close the north floodgate and open the south floodgate completely to make as much as we can of the reservoir capacity. The north floodgate was thus closed on July 27. As expected, during the first 10 days of August, torrential rain fell over Jialingjiang. At the time, there were only a few rain guaging stations and there were only a few years of data. We used only the information of eight floods, five floods between June and September, 1952 and three floods in July, 1954, to analyze the relationship between the average amount and the net amount of rainfall in the flow producing area. This relationship was very good. Also, because the area of the river basis was too large (about 160,000 square kilometers), we could not use unit lines so we changed to using standard runoff distribution curves. Using these two tools, we forecast the course of flow at Dongjintuo, the outlet spillway of the Jialingjiang. Then we used the combined flow to forecast the course of flow at Cuntan Station in Chongqing on the main stream of the Changjiang. We then derived the amount of downstream flood water and calculated that the highest water level in shashi would reach 45.63 meters if the flood waters were not diverted. To keep the water level at Shashi at or below 44.49 meters as much as possible, we still needed to separately store 2.5 billion cubic meters of flood water. At the time, the flood-diversion area had already stored 4.8 billion cubic meters, and it could not take in any more. Therefore, we proposed a plan to break open the eastern embankment of Huduhe to separately store the flood waters and thus the highest actual water level in Shashi was controlled at 44.67 meters (0.18 meters higher than the guaranteed water level). We preserved the large embankment of Jinjiang and the production of the several million mu of farmland on the northern bank, the lives and the safety of the people. After making a flood forecast, we continued as a matter of course to modify and readjust in diverting flood waters. The latter is the true goal in flood prevention, and when combined with previous efforts, we will be able to develop a greater "advisory" function.

2. Huaihe: During the middle 10 days of July in 1954, all of the flood water storing area beyond Zhengyangguan on the Huaihe had already been filled. After 15 July, a third torrential rain occurred over the Huaihe. The center of the rainstorm was over the middle and lower reaches of the Shayinhe, over the Huaihe's tributary, the Shihe and over the Weihe river basin. At the time, the flood waters at the upper reaches of the main stream of the Huaihe had not receded. With the water coming from the Jinhe, the Shihe and the Weihe, the large Huaibei embankment below Zhengyangguan was threatened. According to calculations of the flood waters, the forecast flow of the flood peak at the Zhengyangguan was 9,780 cubic meters per second, surpassing the high water level of 9,000 cubic meters per second and this would last for 4 days. If we used Wabuhu and Shouxihu to store the flood water, the amount of flow at the flood peak could be reduced to 7,680 cubic meters per second. Therefore, at 0030 hours on July 20, the most serious threat to the large Huaibei embankment was removed (the large Huaibei embankment protected the safety of nearly 10 million mu of farmland in the Huaibei plain and the medium and small towns in the two prefectures of Fuyang and Shuxian). But the serious threat was still to come. If the large embankment of Hongzehu or the large embankments of Gaoyouhu and Liyunhe burst, 10 million mu of farmland in norther Jiangsu and a large number of towns would be flooded. All of the flood waters of the Huaihe would have to pass through Hongzehu for downstream discharge. Besides the main irrigation canal which diverted and discharged 800 cubic meters per second of flood water, the rest must all pass through the Sanhe floodgate (with a designed flood discharge of 8,000 cubic meters per second) and discharge into Gaoyou and Baoying Lakes (abbreviated Gaobaohu), and then discharge via spillways into Changjiang. To guarantee the safety of the large embankment of the Hongzehu, the highest water level at Jiangba should not surpass 15.2 meters. To prevent the embankments of Gaoyouhu and Liyunhe from bursting, the highest water level in Gaoyouhe should not surpass 9.5 meters. Therefore, after forecasting the course of the amount of waterflow entering Hongzehu, there were still two problems that had to be solved: the amount of rainfall over the area surrounding Hongzehu and on the surface of the lake during the forecast period and a plan to utilize the Sanhe floodgate. Concerning the first problem, we referred to rainfall data over the lake area during the same periods in the past, especially analyzed and studied the amount of rainfall during the latter period of the big 1931 flood. Because the amount of rainfall was not large, we made a slightly safer estimate and the effects were very small. Therefore, the key of the question was the plan to utilize the Sanhe floodgate. If we increased the amount of flow at the beginning, the water level in Hongzehu would quickly drop, and the outflow from the Sanhe floodgate would be small, but the water level in Gaobaohu would rise quickly. The amount of discharge into the spillways in the Changjiang could be increased. If the Sanhe floodgate could not control the downstream discharge in time, it was very possible that the water level in Hongzehu would be lower than 15.0 meters while the water level in Gaobaohu would surpass 9.5 meters. Conversely, when the Sanhe floodgate reduced the amount of flow to force the water level in Hongzehu to rise, then because the water level in Gaobaohu was lower and the amount of water flowing into the Changjiang via spillways was small, there was the possibility that the water level of Hongzehu would surpass 15.2 meters. The best plan was to keep the water levels in Hongzehu

and Gaobaohu both below 15.2 meters and 9.5 meters respectively, and to maximize the flood prevention capacity each lake shared. At the time, to guarantee the safety of the Lixiahe area in northern Jiangsu Province, somebody proposed to build a temporary flood-diversion embankment employing 300,000 workers, diverting the flood waters north of the main irrigation canal in northern Jiangsu and south of the temporary flood-diversion embankment and let the flood water flow into the sea. This plan involved mobilizing a massive labor force, spending large funds, and flooding some of the land, but yet it could not ensure that the new embankment would allow water to pass. Therefore, we calculated the various plans of utilizing the Sanhe floodgate in order to rationally utilize the reservoir capacities of Hongzehu and Gaobaohu and the capability of the spillways leading into the Changjiang to discharge the flood. At the time, there were no computers. Everything had to be calculated by conventional methods. Finally, the best plan was found. The Sanhe floodgate was opened to discharge the flood waters until the water level in Gaoyouhu reached 9.2 meters. The Sanhe floodgate controlled the downstream discharge at 9,000 cubic meters per second. When the water level in Gaoyouhe rose to 9.4 meters, Sanhe floodgate controlled the downstream discharge at 8,500 cubic meters per second. Using this control method, we forecast that the highest water level at Jiangba in Hongzehu would be 15.20 meters, the highest water level of Gaoyouhu would be 9.40 meters, and this was a more ideal operating method. After operating the Sanhe floodgate according to this plan, we avoided building a new embankment to divert the flood water and to guide the water into the sea. By so doing, we could still guarantee the safety of the Lixiahe area in norther Jiangsu Province. The highest water level actually measured at Jiangba in Hongzehu during the operation coincided with the forecasts. The highest water level in Gaoyouhu was 9.32 meters, a difference of 8 centimeters.

The above example further shows the significance of combining forecasting methods with flood prevention and control methods.

Conclusion: The problems that we may encounter in actual forecasting in the effort to fight floods will be very complicated. This article has only briefly introduced several problems that should be noted. Of course, not everything is included. But, in view of the above description, we can already demonstrate that simply relying on the forecasting plan is insufficient. To be a good forecaster, familiarity with the hydrological and meteorological characteristics of the specific river basin and human activity and especially the situation of water conservancy and its protection projects is very important. In addition, flood forecasts can function as the "ears and eyes" of flood prevention work, and by combining forecasting efforts with flood water control we can give full play to this "aid" function. This function is very obvious in actual flood prevention.

9296
CSO: 4007/576

'GUANGMING RIBAO' ON PRC AGRICULTURAL STRATEGY

HK161210 Beijing GUANGMING RIBAO in Chinese 7 Nov 82 p 4

["Economics Trend" column: "Summary of Views Put Forward at the Symposium Held by the Chinese Agricultural Economics Society"]

[Text] The Chinese Agricultural Economics Society held its 1982 symposium in Hefei during the last 10 days of October. The meeting discussed China's strategy for agricultural development and the agricultural responsibility system. We now summarize the main views put forward at the symposium as follows:

China's Strategy for Agricultural Development and Ways to Achieve It

With respect to China's strategic objective of agricultural development, different views were put forward at the meeting. There was a view which held that, fundamentally speaking, China's strategic objective of agricultural development is to achieve modernization of China's agriculture, that is, to have a developed agriculture, prosperous rural areas and a good environment. Another view held that China's future agricultural development should be centered on developing commodity agriculture, ecological agriculture and scientific and technological agriculture and changing the self-sufficiency, disproportion and the present state based on traditional experience.

With respect to the ways of achieving China's strategy for agricultural development, some comrades aired their views as follows: the fundamental way to develop China's agricultural production is, on the basis of improving land productivity, improve agricultural labor productivity. At the same time, with regard to the content of production, it is necessary to reform the agricultural production and rural industrial structure. Reforms in agricultural production refer to a shift from paying exclusive attention to grain and viewing things from the angle of 1.5 billion mu of cultivated land to paying simultaneous and vigorous attention to diversified undertakings and viewing things from the angle of 9.6 million square kilometers of our territory and taking the road of all-round development of agriculture, forestry, animal husbandry, sideline occupation and fishery. Reforms in the rural industrial structure refer to the gradual development of comprehensive operation by agriculture, industry and commerce. Some comrades emphatically pointed out that it is necessary to pay attention to the "rate of formation." In organizing production, it is necessary to reform the structure of agricultural production areas and the administrative structure of enterprises. That is to say, it is necessary to shift from the structure of "small but complete" areas and enterprises to specialized production in order to constantly improve the standard of mass agricultural production. With respect to the key element of productive forces, it is necessary to readjust and reform the structure of rural labor force technology and energy resources: We should absorb, by means of developing the range and quality of production, the surplus labor force in the rural areas and gradually transform them on the spot into nonagricultural population; we should reform the structure of agricultural technology by taking the road of integrating organic agriculture with inorganic agriculture; in reforming energy resources in the rural areas, great attention should be paid to the utilization of biological energy but it is also necessary to increase the supply of industrial energy such as petroleum, coal and electricity. With respect to the utilization of soil, we should take the road of intensive farming and pay attention to the expansion and protection of agricultural land. The core of agricultural development strategy is to improve economic results. We should base ourselves on this when determining and testing the ways and measures for achieving agricultural development strategy.

Grain strategy is a basic strategy of our agriculture. We should apply the strategic thinking of integrating long-term with short-term planning to guide and solve China's grain problem. Reliance on the existing cultivated land can only slightly ameliorate China's grain shortage. In order to fundamentally solve the grain problem, we should rely on 14.4 billion mu of our territory. We should base ourselves on the existing land for growing grain and have the whole territory in mind. At present, we should stabilize the acreage of commodity grain-growing areas. Resolute steps should be taken to readjust the high-yield cultivated land suitable for growing grain which has been planted with low-yield industrial crops.

The Contract System Based on Output with Household as Production Unit Will Exist for a Long Time to Come

The comrades who spoke at the meeting hold that the contract system based on output with a peasant household as the unit is a form of socialist cooperative economy. Some comrades expounded this point from the following three aspects: 1) It is an economic structure integrating a unified administration with a decentralized one, with the one being interdependent on the other. 2) It is a form of contract and distribution in a production team based on unified accounting. 3) The households signing contracts based on output will develop in the direction of a union based on specialization.

Quite a few comrades held that the contract system based on output with the peasant household as a production unit conforms to China's characteristics. It has been chosen by the peasant masses after many years of practice and it will exist for a long time to come. The essential basis they provided are as follows:

1. The relative stability of blood relationship in the household of Chinese society. In China, the organizational form of taking a household as the production unit goes back to ancient times. At present, China's agricultural production is still conducted in a decentralized manner and is primarily done by hand. Under these circumstances, this form, which is readily acceptable to the peasant masses, has a relatively stronger force of inner attraction.

2. The requirement of the feature of agricultural production. Some comrades held that the technological level of our agriculture was low. The previous method of great concentration (concentration of property, management, distribution and labor) was practically a method of running agriculture with the method of running industry. The organic structure of capital in modern industry is very high, its division of labor is well-organized and each producer only undertakes work for a certain link. It has both fixed quantitative and qualitative requirements and scientific means of inspection. Therefore, we must and are able to conduct concentrated management in industry. However, this method cannot be applied in the present agriculture which has a very low level. Agriculture is the production of living materials. The conditions to which it is related are more complicated than those of industry and various factors such as weather, soil and the contents of fertilizers and water constantly change. Unless future agriculture can be turned into factory production, it will be necessary for laborers to make frequent responses and policy decisions according to circumstances. This makes it necessary for the agricultural administrators and producers to be in unity as much as possible. Therefore, it is relatively appropriate to have a household as the production unit. Some comrades also raised a question from another angle. In agricultural production, due to the considerable influence of natural force, the circulating labor thrown into production is frequently out of proportion to the final yield of labor. The unified calculation of workpoints on the basis of work done has brought about a lot of problems. The adoption of the contract system can prevent contradictions because it places the final responsibility for production on the households. At the same time, agriculture also has a feature characterized by the intermittence of labor. By adopting a household as the production unit, the peasant households can make full use of the intermittent time to engage in diversified undertakings and make a comprehensive utilization of various agricultural and sideline products in a more effective way.

The comrades who spoke at the meeting said that the current contract system based on output with a household as the production unit is a very "flexible" organizational form. Viewed from the practical experiences at home and abroad, it not only suits the present needs but also the future needs for achieving agricultural modernization. Therefore, this organizational form will exist in China for a long time to come. Some people, basing themselves on their previous long and habitual understanding, regard the contract system based on output with a household as the production unit as a retreat, a provisional measure or an expediency. The peasants do not feel at ease with this either. A clear definition of the protracted nature of this organizational form will help to ease their minds.

CSO: 4007/58

PRC PEASANTS' PURCHASING POWER INCREASES

OW151421 Beijing XINHUA Domestic Service in Chinese 0047 GMT 15 Nov 82

[Excerpts] Beijing, 15 Nov (XINHUA)--What will be the trends in the brisk rural market after the autumn harvest this year? The recent surveys of supply and marketing cooperatives in some provinces and municipalities show: The peasants' purchasing power after the autumn harvest this year will continue to increase by a big margin, the brisk market will come earlier and persist longer in the countryside this year and there will be some changes in the direction in which peasants will use their purchasing power.

Rural market surveys have been conducted by supply and marketing cooperatives in Zhejiang, Jiangsu, Hunan, Hubei, Shandong, Henan, Heilongjiang, Jilin, Liaoning, Gansu, Guizhou, Sichuan, Guangdong, Anhui, Shanghai and Shanxi.

The Hubei provincial supply and marketing cooperative has conducted a sampling survey of 214 peasant households scattered throughout the province, which shows that each household's income from agricultural and sideline production this year will increase 33.5 percent over last year and that each household's average income will be 1,178 yuan. A survey of 310 peasant households shows that each of the households will spend more than 700 yuan in the market, a 33 percent increase over last year.

The surveys of some rural areas show that since large numbers of commune members are anxious to increase production after the institution of the production responsibility system, they now give first priority to buying means of agricultural production. The amount of money 139 peasant households in Jiangsu have used to buy means of agricultural production after this year's autumn harvest has increased 47.8 percent over last year.

The surveys conducted in various areas show that after buying means of production and building houses, many peasants will spend their money mainly on consumption articles. Famous-brand bicycles, sewing machines and desk clocks are still very much welcomed by people in the countryside.

CSO: 4007/58

METHODS OF SOWING WHEAT IN FURROWS EXPLAINED

Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER] in Chinese No 9, 20 Sep 82 p 11

[Article by Li Jiwu [2621 4949 2976], Crop Institute, Chinese Academy of Agricultural Sciences: "Markedly Increased Yields From Furrow Sowing of Wheat and Concentrated Fertilization"]

[Text] A combination of sowing wheat in furrows, concentrated fertilization, and compacting of the soil links traditional experience to modern scientific techniques for all-around measures in crop resistance, consistent yields, and increased yeidls. This results in pronounced consistently increased yields particularly in arid, infertile, aline-alkaline land, and in the far-flung moderate and low yield of the arid northwest.

Advantages

(1) Sowing of seeds in deep furrows covered with a shallow layer of soil is a way to get enough soil moisture in arid places to be able to sow wheat, and to sow more wheat on time. Since soil moisture conditions in the bottoms of furrows are better relative to the soil surface, seedlings grow evenly, completely, and quickly, and their root systems develop. They are able to absorb a great deal and plants are sturdy, with the result that the wheat's drought resistance is increased.

(2) In places where wheat is prone to freeze damage, use of the deep furrow, light cover method of sowing makes the plants grow sturdy, and it can lower the position in the ground of tillering nodes. When tillering nodes are relatively deep in the soil where soil moisture conditions are better and there is less variation in temperatures, soil temperatures are evened out, and the number of dead seedlings resulting from freeze damage to tillering nodes is reduced. Furrow sowing also helps accumulate snow to withstand cold. This both saves work and trouble as compared with covering the wheat with sand or pulverized soil.

(3) Inasmuch as soil alkalinity and salinity is distributed in a "T" shape, by forrow sowing wheat in saline-alkaline areas opening of the furrows pushes the salt toward the ridge along the top of the furrow where it tends to concentrate serving to protect the seedling from coming in contact with it down in the furrow. Seedling roots and tillers develop commensurately enabling the plants themselves to increase their ability to withstand salinity and alkalinity.

(4) Watering fills the seeding furrows with soil, which checks the growth of small tillers and promotes growth of large tillers. In addition, the base nodes of wheat stalks are buried in the soil and are able to grow node roots, thereby greatly increasing the wheat's capacity to absorb nutrients and resist lodging. This is a good way in which to yet high yields without lodging.

(5) When sowing in furrows is combined with hilling, the back of the furrow becomes a trough, and because of the deepening of the location of the rhizosphere, the temperature of the rhizosphere is relatively low and constant. This can strengthen the root system's vitality and prevent premature degeneration of the root system for relatively good results in increasing plant ability to withstand hot dry winds during its later stages of growth.

(6) Furrow sowing in combination with concentrated fertilization entails placing the fertilizer beside the seeds, the fertilizer and the seeds being separated from each other. Nutrients are concentrated and the fertilizer utilization rate is high.

(7) Furrow sowing in hilly areas can reduce ground runoff and prevent soil erosion. In irrigated areas, when used in combination with furrow irrigation, a saving in water can be effected.

(8) Compacting the soil plays an important role in arid areas in increasing soil and conserving soil moisture.

Results of experiments everywher show that furrowsowing has brought varying degrees of inrease in yields. Take Beijing Municipality as an example. Comparison of figures for furrow sowing and flat sowing in 15 cases showed yield increases of less than 10 percent in 40 percent of the cases. Yield increases of from 10 to 20 percent occured in 33 percent of the cases. In 27 percent of the cases, yield increases were above 20 percent. Another example was Hengshui Prefecture in Hebei Province where statistics from seven places showed average yields of 469.7 jin per mu from furrowsowing versus yields of 417.8 jin per mu from flat sowing, 51.9 jin per mu more from furrow sowing for a 12.4 percent increase. Four places were in low yield areas where the average yield from furrow sowing was 208.3 jin per mu and 169.9 jin per mu for flat sowing, which was 39.4 jin per mu, or 22.6 percent, more from furrow sowing. When furrow sowing was used in arid and alkaline medium or low yield level field plots, the extent of increase in yields was greater.

Method

The specific method used in furrow sowing of wheat may be roughly divided into the following steps:

The first is use of the interchangeable machine chassis used by the Crop Institute of the Chinese Academy of Agricultural Sciences for furrowing, concentrated fertilizing (60 jin per mu of ammonium bicarbonate and 100 jin of calcium superphosphate), and soil compacting, which are completed in a single combined operation. The furrow sowing machine uses a hoe-shaped furrowing device to make furrows that are 1.2 chi wide and 3 cun deep. Two rows of seeds are sown in each furrow, the two rows being 4 cun apart and the furrows being 8 cun from each other. The seeds are covered with 3 to 4 centimeters of soil. The calcium superphosphate is air dried, pulverized, sifted, and blended with the ammonium bicarbonate and a vibrating fertilizing device spreads the mixed fertilizer along the sides of the two rows of seeds in the furrow, 2 to 3 centimeters apart. When sowing is done, the soil is rolled to bring up soil moisture.

The second kind is the furrow seeding method used in places like suburban Beijing. On the front of the seed sowing machine is mounted six boot-shaped spades that do the furrowing, and a single disc double row comination furrowing device follows along the furrow to sow the seeds. The furrow is 1.2 chi wide, and two rows of seeds are sown in each furrow, the rows being 3 cun apart and the furrows being 6 cun from each other. Alternatively furrows may be 6 cun apart with a single row of seeds being planted in each furrow. An outside trough rotary fertilizing device spreads a flow of nitrogenous fertilizer such as urea or ammonium sulfate at a maximum 45 jin per mu. It cannot spread calcium superphosphate. Behind the machine is a cast place-like circular rolling device that flattens the furrows.

The third kind is a furrowing machine attached to a hand tractor that has been promoted in Shaanxi Province. It opens six furrows at one time, each of them 18 centimeters wide. Mounted on the furrow sowing machine is a fertilizer bin and a seed bin. The fertilizer bin bholds pulverized calcium superphosphate. Nitrogenous fertilizer is mixed with the seeds in the seed bin, and is spread simultaneously with the seeds. After sowing is done, the soil is compacted. When fertilizing (calcium superphosphate being applied to a depth of a 8 centimeters), both the seeds and the nitrogenous fertilizer are sown to a depth of 3 to 4 centimeters after which the soil is compacted. All four operations are completed at one time.

Cautions

(1) Furrowing and sowing of seeds cannot be readily separated, particularly in drylands. Practice has shown that a combination machine that furrows, fertilizes, sows, and compacts in one continuous operation is best.

(2) Furrow-sown wheat fields are easily prone to burial under windblown sand and watering of silted furrows may press down on tillers causing insufficient spiking per mu. Care should be taken to increase the amount of seeds sown to enlarge the number of plant colonies in order to assure a sufficient number of spikes.

(3) In order to increase the soil utilization rate, in field plots that are relatively fertile furrow width should be increased so that two rows may be planted in each furrow.

(4) In saline-alkaline areas, after furrow-sowing has been completed, compacting of the soil should not be done nor should the soil be hilled up around plants.

9432
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REVISED FORMULA FOR CALCULATING SEED NEEDS EXPLAINED

Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER] in Chinese No 9, 20 Sep 82 p 3

[Article by Chen Zhenming [7115 2973 2494], Xianning Prefecture Agricultural Institute, Hubei Province: "Correction of Quantities Needed for Seeding on Basis of Per 1,000 Seed Weight"]

[Text] In the course of experiments when quantities of seeds needed for the sowing of paddy rice and wheat had to be generally determined, the following formula was used:

$$\text{Actual Amount of Seeds to be Sown} = \frac{\text{Planned Amount of Seeds Sown (Jin Mu}}{\text{Cost of Using Seeds}}$$

with cost of using seeds = Degree of seed cleanliness x sprouting rate ÷ 100. The shortcoming of this formula is that is has not taken into consideration the different per thousand (or per hundred) weight of seeds for different varieties of crops, which varies greatly. As growing seasons and farming conditions change, for the same variety seed weights change correspondingly. For example, by using the above formula to calculate quantity of seeds to be sown, the weight obtained for large seeds may be right, but the weight obtained for small ones may be overly large. In order to increase accuracy of experiments, I worked out the following corrected formula based on the per thousand seed weight:

Planned Amount of Seeds to be Sown (Jin/mu) = Standard Quantity of Seeds to be Sown (10,000/mu) x per thousand weight x 2 ÷ 100.

Since the corrected formula divisor is 100, after multiplying the standard quantity of seeds to be sown (10,000 seeds/mu) by twice the per thousand weight of the seeds (or 20 times the per 100 weight of seeds) and moving the decimal point two places to the left, the planned amount of seeds to be sown (jin/mu) can be derived.

For example, in comparative experiments of certain paddy rice varieties, it was determined that for the seedling field the standard quantity of seeds to be sown was 4 million seeds/mu. For variety A, the per 1,000 weight was 30 grams, so the planned amount of seeds of that variety to be sown = 400 x 30 x 2 = 240.00 (jin/mu). For variety B, the per 1,000 weight was 25 grams, so the planned amount of seed worked out according to the formula was 200 jin/mu. For variety C, the per thousand weight was 20 grams, so the planned amount of seeds worked out by the formula was 160 jin/mu.

After calculating the planned quantity of seeds to be sown according to the foregoing corrected formula, on the basis of seed use cost the actual quantity of seeds per mu can be derived. For dryland crops, in addition to these calculations, it will also be necessary to estimate the field sprouting rate in order to determine the actual quantity of seeds to be sown per mu.

9432
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DOUBLE-CONTRACT ECONOMIC SYSTEM

HK111126 Beijing GUANGMING RIBAO in Chinese 31 Oct 82 p 3

[Article by Zhang Guangyou [1728 1684 0645]: "A Probe Into the Trends of Developing the 'Double-Contract' Responsibility System"--passages within slantlines published in boldface]

[Text] Since the 3d plenary session of the 11th CPC Central Committee, our rural areas have generally established and perfected all forms of the production responsibility system. The enthusiasm of the masses of peasants has been aroused and a heartening picture of prosperity in our agricultural production has emerged. Through several years of repeated practice, contrast and selection, the double-contract responsibility system (the system of assigning the households full responsibility for task completion and the system of setting fixed output quotas for each household) now plays a leading role in China's rural areas and has become the principal responsibility system. According to incomplete statistics, the double-contract responsibility system is practiced in more than 70 percent of China's rural areas. In Guizhou, Gansu, Anhui, the Nei Monggol Autonomous Region, Fujian, Henan, Ningxia and Hunan, the system is practiced in more than 90 percent of their rural areas. Most of the households which practice the double-contract responsibility system practice the system of "assigning the households full responsibility for task completion" and this responsibility system is still developing in some provinces and regions. Thus the question of how this responsibility system developes in the future is one which attracts the attention of people.

//It Is Necessary to Clarify the Nature of the "Double-Contract" Responsibility System//

In order to clearly determine the trend of development for the "double-contract" responsibility system, particularly the trend of development of the system of assigning the household full responsibility for task completion, first of all it is necessary to clarify a condition, that is, the nature of the "double-contract" responsibility system. In October 1981, Comrade Hu Yaobang met delegates to the meeting on rural work in China. He said to them: "Our policy has not shattered the collective economy. Land, the most basic means of production, is still owned by the collectives. The contract itself tells us that the nature of the system of collective ownership is not changed. The peasant used to say 'distribute the land.' It is incorrect to say that the system of assigning the households full responsibility for task completion is to 'distribute the land and work on one's own'." A large number of facts prove that: The "double-contract" responsibility system is not to "distribute the land and work on one's own," it is not individual economy and it is absolutely different from the small-scale peasant economy before the liberation. It is a form of the responsibility system which suits the actual conditions of most areas in China and is well received by the masses of peasants.

But there are a few people who hold that "the 'double-contract responsibility system' divorces ownership from the right of use. Ownership no longer plays the decisive role. Thus the 'double-contract responsibility system' is in fact land distribution." Such views are of course not in accordance with reality. In production relations, the ownership of the means of production plays a decisive role, and there is no exception in any society. In a feudal society, ownership of the land belonged to the landlords. Land was rented by the peasants for cultivation and the right of use belonged to the peasants. In that case, can we say that the ownership of land did not play a decisive role? Our society is basically different from a feudal society, but the right of use is still not the same as ownership. Production brigades can still exercise their right of ownership and announce that fields under the system of setting fixed output quotas for each household are taken back or adjusted; the users of the land do not have the right to handle the land. No matter whether it is under the system of assigning the households full responsibility for task completion or under the system of setting fixed output quotas for each household, the land is still owned by the collective and not by individuals. There are still some who say that: "The system of public ownership of land cannot determine the nature of the 'double-contract responsibility system.' There are capitalist states which practice the system of state ownership of land, so can we say that this is a socialist feature?" Those who hold such views have forgotten the most fundamental presupposition that our country is characterized by dictatorship of the proletariat; they have forgotten that the problem we study is a problem of socialist China under the leadership of the communist party.

Of course, in implementing any responsibility system, it is inevitable that there will be all sorts of questions and there is no exception in implementing the "double-contract responsibility system." For various reasons, when some regions practice the "double-responsibility system," problems appear. For instance, disputes arise over the use of farm cattle and irrigation facilities, land being divided into extremely small pieces, machines not playing their roles, property of the collective not being well protected and the problem that the four kinds of households, which have martyr members, soldier members, overseas members and members in Taiwan, as well as the households enjoying the five guarantees are not well arranged. Attention should be paid to these problems. But we should see that the above problems are not the problems of the "double-contract responsibility system" itself, but are problems related to work. Exactly for this reason it is extremely necessary to combine ideology and understanding and improve and strengthen leadership in the process of implementing and perfecting the responsibility system in agricultural production.

//The Masses Decide Which Kind of Responsibility System They Will Practice//

There are many forms of the contract responsibility system which links remuneration to output and which is now being practiced in the rural areas. There is the system of setting fixed output quotas for each household, the system of assigning the households full responsibility for task completion, the system of assigning responsibilities to each laborer and linking remuneration to output, the system of assigning responsibilities to each group and linking remuneration to output and the system of specialized contracts. Sometimes several forms are practiced at the same time or they overlap each other. This is quite normal. But there are people who say that the system of assigning the household full responsibility for task completion is an "elementary" responsibility system and they suggested that the "double-contract responsibility system" be guided by the system of "setting a fixed output quota for each laborer."

I think that whichever responsibility system we choose, we should not proceed from such abstract terms as "high-level" or "elementary," but we should see whether the form suits local conditions and the experience of the masses. As long as the form suits local conditions, promotes production development and is welcomed by the majority of the people, then this responsibility system is suitable as far as the place is concerned. On the contrary, if there is a responsibility system which many people hold is of an extremely "high level," but is not suitable for the place, harmful to production development and not accepted by the majority of people, then such a responsibility system should not be adopted. Just as people said in the rural areas in Henan: "Whether a form is good, the stomach indicates it, whether a form is elementary or of a high level, the judgment is based on the increase in production."

Then on what do we base deciding what form of responsibility system should be adopted? To sum it up, there are two points: First, proceed from reality, suit measures to local conditions and adopt whichever responsibility system we find suitable; second, let the masses of peasants have the right to choose and decide. In the process of investigation, we deeply felt that the adaptability of various forms of the responsibility system had the nature of an objective law which did not change according to people's will. There is process in which the adaptability of the responsibility system is verified by practice and observed, contrasted and selected by the masses. Leaders at all levels should avoid by all means subjectively and one-sidedly pursuing certain forms and should sincerely give the masses the right to choose. China is a country with a vast territory, and because natural conditions and economic based are not the same in all places, it is unrealistic to seek uniformity. Unhealthy results will be produced if we cut ourselves off from the masses and reality and blindly pursue the so-called "high-level" forms.

It is necessary to point out that if we take the responsibility system of assigning the households full responsibility for task completion as the most elementary form, we will come to the necessary conclusion that: The "double-contract responsibility system" is only an "expedient measure." We should admit that: At the present stage, the "double-contract responsibility system," particularly the system of assigning the households full responsibility for task completion, is a better responsibility system under the Chinese way of socialist agricultural management. Because compared with other responsibility systems, "the benefits are most direct, responsibilities most concrete and method most simple." This form suits the economic and natural conditions of most places in our country; in a certain sense, this form is an important measure of business management which our country has discovered through repeated practice and by paying a price on its way to collective agriculture. On the one hand, it has promoted the superiority of the collective economy, and on the other hand, it has fully aroused the enthusiasm of the masses of peasants and has solved a fundamental problem in collective business management that has not been solved for a long time.

//It Is Necessary to Stabilize and Perfect But Do Not Help the Shoots Grow by Pulling Them Up//

We should be positive that the "double-contract responsibility system" has a broad mass base and that it has strong vitality. But faced with the present situation of the "double-contract" responsibility system, it is necessary to make a concrete analysis. Judging from the actual situation in many places, since the "double-contract" responsibility system is practiced for a very short time and people have no experience, there are many practical problems which must be solved as soon as possible. For instance, the problems of how to unify planting plans, how to fully promote the roles played by the existing irrigation conditions and the grand-sized agricultural machines, how to make arrangements for the livelihood of the "households enjoying the five guarantees" and do subsidy work for the families of martyrs and soldiers, how to make arrangements for surplus manpower, how commercial undertakings can adapt to the rural areas and so on. Thus, to solve the problems which will surface after the "double-contract" responsibility system is put into practice and to continuously consolidate and perfect the system through practice is a central link of rural work at the present stage. The view that after the "double-contract responsibility system" is put into practice the peasants will have had initiative in production, that the peasants' enthusiasm will have been aroused and that it will no longer be necessary to strengthen leadership are extremely erroneous and harmful views.

Attention should be directed to the fact that there are people who think that under the "double-contract" responsibility system, the household is taken as a unit in its management, that it is an "all-round but small" form and that it is not advantageous to large-scale socialist production. They suggest we should strike while the iron is hot and put "specialized integration" into practice as soon as possible. How should we look at the so-called "all-round but small" system which takes the household as its unit? I think that first, we should see that it is suitable for a majority of the existing economic conditions and the level of business management in China at the present stage. Planting is the principal feature of agricultural production. The system with the household as its unit of management suits the characteristics of agricultural production and meets the demands of the masses of peasants. It should be clarified that the size of the production organization and the number of people who work together do not indicate the level of advance of production relations and the level of labor efficiency. In China, the size of the population is large while there is limited cultivated land, and it is necessary to practice a high degree of intensive management in agricultural production and do something in intensive cultivation. Of course, with development in production, the "double-contract" responsibility system may take the road of "specialized integration." But judging from the majority of production brigades which practice the "double-contract" responsibility system, we do not have the conditions necessary for "specialization" and "integration." A healthy and perfect stabilizing stage is necessary. Since the movement to organize cooperatives, there have been many policy changes, and the masses of peasants doubt the party's policies. At present, in places where the "double-contract" responsibility system is practiced, the masses are afraid of policy changes. If we do not proceed from the actual situation and put forward the slogan of "specialization" and "integration" when it is still early or in an improper manner, we will harm the stabilization and perfection of the "double-contract" responsibility system. Historical experience has proven that an important economic reform requires a long period of stabilization. We should learn the painful historical lesson and avoid by all means committing the foolish act of helping the shoots grow by pulling them up and avoid being over-anxious for quick results.

CSO: 4007/58

PRC'S WANG WEI EXPLAINS FOOD HYGIENE LAW

OW150351 Beijing XINHUA Domestic Service in Chinese 1411 GMT 12 Nov 82

[Text] Beijing, 12 Nov (XINHUA)--Explaining the draft PRC Food Hygiene Law at the 25th meeting of the 5th NPC Standing Committee held here today, Vice Minister of Health Wang Wei said that the draft law was written at a time when the whole country was implementing the PRC food hygiene control regulations promulgated by the State Council in 1979, as well as other food hygiene laws and regulations, after summing up the experiences and lessons of the past 30 years and more in connection with the supervision and control of food hygiene and also relevant existing problems, and after studying the food hygiene laws and regulations of a number of countries.

He said that drafting the law began in April 1981. Since then, the Ministry of Health has held more than 20 investigation and discussion meetings, and copies of the law have been distributed to the health and other departments concerned in various provinces, autonomous regions and municipalities directly under the central government, as well as to the concerned ministries and commissions of the State Council in order to extensively seek their opinions. More than 1,400 suggestions have been received, and the law has been revised more than 10 times. The general concensus is that promulgation of the Food Hygiene Law is absolutely necessary. The draft law was approved by the State Council at its routine meeting held on 6 November 1982.

Wang Wei said: The Food Hygiene Law has 45 articles in 9 chapters. Its main contents are: More specific regulations for food production, materials and vessels used for transporting food, food additives, materials and tools used for food packing and the management of equipment; explicit provisions requiring all production management departments and the units under their authority to be responsible for their own food hygiene and safety and to establish hygiene control and inspection organs; provisions on the adoption of a state system for supervising food hygiene and on fixing the responsibility of food hygiene supervisory organs and that of the personnel therein; and provisions on fixing the legal liabilities of those who cause harm or damage in violation of this law, aimed at protecting the interests of the people.

Wang Wei said: Since the founding of New China, satisfactory progress has been made in food hygiene work. However, the decade of domestic turmoil seriously disrupted this work. In addition, it has failed to catch up with the different ways of operating production. With the development in industry, agriculture and other fields, more possibilities exist for contamination of foodstuffs. This has caused food hygiene to deteriorate, and some cases have even posed a threat to the people's health and life and have adversely affected the four modernizations.

He said that patriotic health movements, launched since the founding of New China, have played a role in improving food hygiene. After the promulgation of the law, it is still necessary to strengthen the patriotic health movement. He suggested that patriotic health movement committees at all levels should continue to organize the masses for this purpose, to pay attention to propaganda and education on the legal system, morality and knowledge concerning food hygiene, and employ the means of inspection, appraisal, criticism and commendation to inspire the departments and units concerned to conscientiously implement the Food Hygiene Law.

CSO: 4007/58

RURAL AGRICULTURAL RESPONSIBILITY SYSTEM PRAISED

HK161230 Beijing GUANGMING RIBAO in Chinese 7 Nov 82 p 1

[Commentator's article: "The Agriculture Production Responsibility System is Created by Peasants"]

[Text] From today on this newspaper will publish a series of reports on how the production responsibility system known as "big contracting" is carried out in Chuxian Prefecture of Anhui Province. The great changes over the past 4 years since the "big contracting," or the production responsibility system of contracting production quotas to peasant households, was put into effect have convincingly proved that the production responsibility system has strong vitality and the development of agricultural production is still in the ascendant.

Do the production responsibility systems of various forms drop from the skies? No. Are they innate in people's minds? Again, no. It is the masses of peasants who created these systems in practice. For a long time in the past, affairs in China's rural areas were always tackled with the methods conceived and enforced by the authorities from one level to another. Peasants had no say in these affairs but could only act according to the directives issued by the authorities. The peasants' enthusiasm was thus greatly sapped. This was an important reason why China's agricultural production grew slowly. In the wake of the 3d plenary session of the 11th CPC Central Committee, the peasants emancipated their minds and took the lead in front of the people of the whole country. They eagerly demanded a change in the previous form of organizing production which was characterized by the rigid concentration of management, labor and distribution. They called for blazing a new trail which is suited to the characteristics of agricultural production and the reality of China's rural areas by shaking off the shackles of "leftist" ideology, old conventions and the previous rigid patterns under the guidance of the line set by the 3d plenary session of the 11th CPC Central Committee. It is under these circumstances that the various production responsibility systems of contracting production quotas to peasant households arose. As a result of this practice, this creation by the peasants has brimmed in the rural areas with vigor and vitality. Production has developed and peasants' mental attitude has also been greatly changed. Lenin said: Living creative socialism is the product of the masses themselves. This truth of historical materialism has now once again been proved in China's countryside.

Having been educated by the communist party for a long time, the Chinese peasants are new peasants [words unclear] to take the road of socialist cooperative economy. Through the comparison between the new and the old societies and from their personal experiences, they have clearly realized that the road of socialist cooperative economy is a broad road which can lead them to opulence. But how should they advance along this road? The practice followed since the 3d plenary session of the 11th CPC Central Committee has shown: 1) We should let peasants take this road by themselves. No person can do this on their behalf by enforcing administrative or other mandatory measures; and 2) we should let peasants gain real economic benefits in a way suited to local and current economic conditions. Matters which are economically impracticable are always refused by the peasants. The violation of the peasants' interests is to divorce the peasants from reality.

Does this mean that the party's leadership can be abandoned? No. It is obligatory on the party to show respect for the creative initiative of the masses when it is wielding its leadership. The party should seriously sum up the experience of the masses and popularize it. The fact that the production responsibility system can play a great role, from its emergence to universal introduction in the vast rural areas, has shown the importance of the party's leadership. Our party's traditional work method of "from the masses to the masses" is precisely reflected in being good at summing up the experiences gained by the masses and seriously popularizing them. It is a pity that for a fairly long time in the past this traditional method and style of work were cast aside due to the influence of "leftist" ideology. In the wake of the 3d plenary session of the 11th CPC Central Committee, party organizations and rural cadres at all levels restored and carried forward the party's good tradition of seeking truth from facts and practicing the mass line. They timely perfected and popularized the production responsibility system created by the peasants. Only thus can such a good situation emerge in the rural areas today.

In order to lead and educate the peasants, it is necessary to first learn from the peasants. Today's peasants are no longer the same as the peasants in the past. Now they have broader vision. They have become laborers in a socialist cooperative economy and are greatly different from the individual peasants in the former era of a natural economy. They have a vast reservoir of creative power. They can certainly break through the fetters of "leftist" ideology and open up a socialist road with Chinese characteristics in China's rural areas. Get yourself moving and go among the peasants, you will sweep all doubts and misgivings from your mind. The great prospect of China's agriculture developing with huge momentum will present itself before your eyes.

CSO: 4007/58

BRIEFS

FALL-WINTER PLANTING STEPPED UP--China has completed fall and winter planting on a scale larger than that of last year. China has basically completed its central task of planting fall and winter wheat, seeding an area 18 million mu larger than that of last year. [Beijing GUANGMING RIBAO in Chinese 7 Nov 82 p 1]

CSO: 4007/58

ABANDONMENT OF CONTINUOUS RICE, WHEAT CROPPING URGED TO INCREASE YIELDS

Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER] in Chinese No 9, 20 Sep 82 pp 17-18

[Article by Xu Huandou [1776 3562 2435], Fengtai County Farming and Forestry Bureau, Anhui Province: "Ways to Solve the Longstanding Fluctuation in Yields from Continuous Rice and Wheat Cropping"]

[Text] Fengtai County is located at 32° 43' north latitude, which analysis of light, temperature, water, and soil ecology shows to be suitable for paddy rice and wheat production. Since 1970, as farmland water conservancy conditions have improved, the irrigated area increased, new superior varieties produced steadily, and chemical fertilizer increased year by year, the country CPC committee has proceeded from realities to propose a production program of "directing the main attack on wheat while expanding paddy rice," which has brought about very great growth of grain production. In 1981, as a result of diligent implementation of the spirit of the Third Plenary Session of the 11th Party Central Committee and institution of different forms of responsibility systems linked to output, wheat and rice output increased. Statistics show that yields from 553,000 mu of wheat were 307 jin per mu, and from 249,000 mu of paddy rice, 743 jin per mu. Furthermore there were some production brigades that produced 500 jin per mu of wheat and 1,000 jin per mu of rice. Nevertheless, we discovered that in some places that have long practiced continuous cropping of rice and wheat, output has fluctuated without moving ahead; costs have become increasingly high; and some problems urgently await solution without which further increases in grain output will be impaired.

Major Problems

(1) High yields for the first several years with yields per mu fluctuating after 6 years of continuous cropping. (Table 1)

Table 1. Rice and Wheat Output Statistics for Xuqiao Production Brigade, Madian Commune

表1 马店公社徐桥大队粮食产量统计

作物项目 (b) 年度 (a)	小 (c) 麦		水 (d) 稻	
	面积 (e)(亩)	单产 (f)(斤)	面积 (e)(亩)	单产 (f)(斤)
1970—1973	3,500	200—250	240	1,000—1,100
1974	3,503	250	485	850
1975	3,670	310	1,230	830
1976	3,780	350	1,400	800
1977	3,155	180	2,050	782
1978	3,670	320	1,830	770
1979	3,066	308	2,000	870
1980	3,759	310	2,500	581

(a) Year
(b) Crop
(c) Wheat
(d) Paddy Rice
(e) Area (Mu)
(f) Yield Per Mu (Jin)

A look at Table 1 shows that for the first several years after improvements in water facilities had been made, rice yields stabilized at a general somewhat more than 800 jin per mu and wheat yields per mu also tended to rise. After 1976, however, not only were rice and wheat yields no longer consistent, but increasing yields also became difficult. Surveys show that right after ricefields were improved, only 50-60 jinof ammonium bicarbonate was required per mu for a harvest of 800 jin of paddy, and pesticide and fertilizer costs per mu amounted to 10-odd yuan. With the passage of time, however, quantities of ammonium bicarbonate and superphosphate fertilizer increased year by year, about 80 to 90 jin per mu of ammonium bicarbonate and 80 jin of calcium superphosphate per mu being applied. To maintain the 800 jin per mu yields, the ammonium bicarbonate requirement is now between 150-200 jin per mu, and even so it is difficult to get 800 jin per mu of paddy, while both pesticide and fertilizer costs have increased tremendously.

(2) Gradual increase in soil alkalinity, decrease in potash content, and serious imbalance in proportions of nitrogen, phosphate, and potash. A survey done at 73 places in 1980 showed only 16 having a pH of 6.5-7.0, 16 having a pH of 7.0-7.5, 10 having a pH of 7.5-8.0, 19 having a pH of 8.0-8.5, and 12 having a pH higher than 8.5. Obviously the pH of some ricefields was greater than the 6.5-7.0 value deemed suitable. Even though the organic content of rice paddy soil was high, the proportions of quick acting nitrogen, phosphate, and potash were seriously unbalanced, a mutually restrictive situation taking place (Table 2). Everywhere paddy fields were potash deficient.

Table 2. Fertility of Clay and Sandy Paddy Soils

Survey Site	Organic Value (%)	Effective Nitrogen (ppm)	Quick Acting Phosphate (ppm)	Quick Acting Potash (ppm)
Shankou Tenth Brigade. Sandy Soil	0.60	5.9	3.4	98.0
County Agricultural Institute Paddy Clay	1.75	6.8	7.8	70.3

(3) Irrational crop patterns for paddy and wheat varieties with prominent seasonal conflicts. As a result of the high yields of hybrid rice in the current season in recent years, some peasant households are concerned only with the present season and unconcerned about the following season. More than 80 percent grow hybrid rice, so this means difficulties for directing the main attack on wheat. Wangyu Production Brigade in Baikuang Commune grows 1,200 mu of paddy rice including 1,140 mu of Shanyou No 3 and 661 for which the growing season is long. This delays the sowing of wehat. On 20 November the Production Brigade started to plant 200 mu of wheat, 700 mu less than in former years.

(4) Growing of a few superior rice and wheat varieties, which provide little potential for increased yields. Survey has found that in most places the paddy rices of choice are Nanjing No 11 and Zhenzhuai. For wheat they are 7023, Fengtai No 3, and Taishan No 1. These have been planted for a long time, and their yields per unit of area are not high. Ever since 1974 the county stock varieties rice farm has stuck to the production of Nanjing No 11 rice and 7023 wheat. Wheat yields are slightly more than 400 jin per mu, and rice yields are about 700 jin per mu. Though many measures have been taken, as a result of the long use of these two varieties it has been very difficult to increase yields per unit of area.

In addition, many years of continuous cropping of rice and wheat have made the soil's cultivated layer become shallow, the soil become sticky, the time when plowing can be done short, and caused deterioration in the soil's physical structure, problems urgently requiring solution.

Means of Solution

(1) Focusing on the overall situation in rational planning of the succession of crops. Rational planning of the succession of crops would not only assure yield increases for any given season, but would also mean increased yields season after season, and would be extremely beneficial in reviving and increasing soil fertility. Places that have continuously cropped rice and wheat for 4 long time could, while increasing yields per unit of area and without any decrease in total output, expand the growing of soybeans, peanuts and such pulse crops as well as rape, green manure, and cotton. Rotational cropping of the soil as wetland, and drylands would be remarkably beneficial in improving the soil's physical structure, in reducing the incidence of diseases, insect pests, and weeds, and increasing crop outputs. Ther should be planned step-by-step crop rotation.

(2) Rational choice and matching of superior varieties and following along in the growing of a certain superior variety for a long period of time does help one figure out the characteristics of varieties so as to be able to take corresponding action to increase yields per unit of area; however, because of the amounts of single nutrients drawn from the soil, the soil becomes deficient in its principal elements and reduced yields result. Under these circumstances, a change of superior varieties can bring immediate increases in yields. For example, some of the production brigades in Xialiang Commune grew Nanjing No 11 for a long time obtaining yields of from 700 to 800 jin per mu. In 1981, the brigade promoted hybrid rice for yields averaging about 1,000 jin per mu, which was from 200 to 300 jin per mu greater than for Nanjing No 11. Therefore, places having the water, fertilizer, manpower, and draft animals might start with an expansion of hybrid rice to increase their rice yields, and go on to cut back appropriately on the area sown to late wheat, increasing the area planted to rape for bumper harvests of both grain and oil.

Different areas with different levels of production and different peasant households may also use a different direction of attack on the problems of rice and wheat production; they should not practice arbitrary uniformity. In the attack on wheat, for example, they should select either a winter or semiwinter variety for more than half their crop, planting the remainder to spring varieties. Hybrid rices requiring a long growing season and variety 661 can be planted on 20 to 30 percent of the area, with rice varieties having a short growing season, such as Nanjing No 11, being grow on 70 to 80 percent of the area so that it can be harvested early and the fields cleared for the succeeding crop of wheat. Conversely, if mostly rice is to be planted, it should be hybrid rice or variety 661 planted on 60 to 70 percent of the area in order to get high rice yields. However, no matter whether the main attack is directed against rice or wheat, there should be no standardization of either the wheat or rice superior varieties grown. Fascination with anything can bring great losses.

(3) Promotion of return of stalks and stems to the fields to nurture soil fertility. In places where conditions permit, return to the fields of stalks and stems, or cutting the rice and wheat higher to allow more straw to remain in the fields should be vigorously promoted, so that they can be plowed under to fertilize the fields. This can both increase the soil's organic content and regulate the ratio of carbon to nitrogen in the soil, and can improve the soil's physical structure so that the soil can be plowed for a long period of time. By leaving in the fields 200 jin per mu of rice and wheat straw, the soil's organic content can be maintained with no dramtic decline.

(4) Change in farming methods, and striving to plant on time. On-time sowing is a prerequisite for sturdy seedlings that develop early. In order to solve the conflict between seasons resulting from the continuous cropping of rice and wheat, some changes in farming methods should be taken in hand. Even while the wheat is being harvested, plowing should begin, the soil turned to a good depth and sunned. Then the fields should be manured, water returned to them, and rice planted. After the rice crop has been harvested, if time is extremely short, sowing may be done after shallow plowing, rotary tilling, and fine raking. Experiments at many places during 1980 have shown that when wheat is sown after rotary tilling of fields from which rice has been harvested, not only do the numbers of basic seedlings increase and seedlings grow evenly in height, but ripening occurs 1 to 2 days early, spikes are large and grains numerous, and yields increase by about 10 percent. In addition, obtaining consistently high rice and wheat yields requires solution to technical problems of sparse sowing for sturdy seedlings, correct understanding of the insect pest situation, prompt prevention and control of crop diseases and insect pests, scientific use of water, sensible fertilization, and cultivation to get rid of weeds.

9432
CSO: 4007/12

BRIEFS

WHEAT SOWING--By 26 October Anhui Province had completed more than 70 percent of its wheat sowing task. The acreage sown was 5 million mu more than in the same period last year. Before cold dew [the 17th solar term], Suxian Prefecture had sown wheat on 1 million mu. By frost's descent [the 18th solar term], it had basically completed its autumn sowing tasks. Chuxian Prefecture has sown 480,000 mu more wheat than last year. [OW301417 Hefei Anhui Provincial Service in Mandarin 1100 GMT 27 Oct 82 OW]

FLOOD VICTIMS--According to an ANHUI RIBAO report, the Anhui Provincial Government and other provincial authorities concerned organized 24 cadres into 8 groups and separately sent them, on 3 November, to Huaibei Municipality, Yingshang, Funan, Linquan, Xiao, Shou, Huaiyuan, Fengtai, Quanjiao and Huoqiu counties, which were seriously hit by floods and waterlogging, to solve pressing food and housing problems for victims there. Every cadre in the inspection groups was required to carry out his job earnestly and to accomplish the task by 22 November so that victims could spend the winter safely. [OW090205 Hefei Anhui Provincial Service in Mandarin 1100 GMT 5 Nov 82 OW]

CSO: 4007/58

BRIEFS

MARINE FISH-FARMING--Fuzhou, 25 Oct (XINHUA)--Output from marine fish-farming in Fujian Province during the first 9 months of this year exceeded 2,356,000 dan, topping last year's total annual output. Some 50,000 mu of laver and over 100,000 mu of oyster and clams remain to be collected. This year, the province has 380,000 mu of marine fish-farming areas, 10 percent larger than last year's. The province's output of laver and shellfish respectively accounts for 80 and more than 50 percent of the nation's total output. [Beijing XINHUA Domestic Service in Chinese 25 Oct 82 OW]

SEA FISH FARMING--Fujian Province's rapid development in marine fish farming since the 3d plenary session of the 11th CPC Central Committee has received favorable comment from representatives of fraternal provinces and municipalities and leaders of the Ministry of Agriculture, Animal Husbandry and Forestry attending the National Sea Fish Farming Work Conference now in session in Fuzhou. As of 1981 the province had 420,000 mu of marine fish farming areas, up from 320,000 mu in 1978, an average increase of 7.7 percent a year. From January to September this year, the catch exceeded the total catch of 1981. Per capita income in the fishing areas in 1981 was 230 yuan, doubling the 1978 figure. [OW031315 Fuzhou Fujian Provincial Service in Mandarin 1120 GMT 28 Oct 82 OW]

CSO: 4007/58

BRIEFS

GRAIN PRODUCTION FORUM--Yesterday the Gansu Provincial Government held a forum in Zhangye on the development of grain production in the Hexi area. This forum discussed and formulated measures to speed up the building of a commodity grain base in the Hexi area. The Hexi corridor in the province is a newly-developed commodity grain base. Since the founding of the country, some 3 million peasants in the Hexi area have persisted in building water conservation projects, leveling fields, improving soil, planting trees and popularizing and applying advanced agricultural technology and measures so that the natural outlook, fundamental conditions for agricultural production and social economic situation have greatly changed. At present, the Hexi area has built 146 medium-sized and small reservoirs, sunk some 24,000 motor-pumped wells and electrically-operated wells, repaired and built channels, some which are 12,000 km long, and expanded irrigated fields by some 3.7 million mu. In the Hexi area, total output of grain in 1980 was some 2.68 billion jin more than in 1979 and the average per mu yield increased from 148 jin to 456 jin. Since 1975, the amount of grain supplied by the Hexi area to the state per year accounted for more than half of the amount of grain supplied by the whole province to the state. The Hexi area has reaped a bumper grain harvest again this year and its total output is 20 percent more than last year. The Hexi area has supplied more than 900 million jin of commodity grain to the state. [HK271418 Lanzhou Gansu Provincial Service in Mandarin 1125 GMT 21 Oct 82 HK]

HEXI AREA FORUM--The Gansu Provincial Government held a forum in Zhangye on the development of grain production in the Hexi area. The forum discussed and formulated the target of struggle for building the Hexi commodity grain base. In accordance with the target of struggle, the average yearly output of grain in 3 years is 3 billion jin and total output of grain by the year of 2000 amounts to 6.1 billion jin; total agricultural output value will increase from 900 million yuan to 3.6 billion yuan; the amount of commodity grain supplied to the state will increase from 890 million jin to 2.5 billion jin; the average per capita income will increase to 600 yuan. To achieve this target of struggle, the forum decided to take the following measures: 1) it is necessary to persist in the socialist orientation, continue to emancipate the mind, seriously perfect the rural production responsibility system and arouse the enthusiasm of the collectives and individual commune members; 2) it is essential to persistently do well in farmland and water conservation construction, further improve fundamental agricultural conditions and strengthen irrigation management; and 3) it is imperative to vigorously popularize advanced agriclutural science and technology and transform the farming system. [Lanzhou Gansu Provincial Service in Mandarin 1125 GMT 26 Oct 82 HK]

CSO: 4007/58

GUANGDONG

BRIEFS

HAINAN SUGARCANE PRODUCTION CONFERENCE--The Hainan Regional Administrative Commissioner's Office recently held a conference on sugarcane production in Haikou. A total of 140 people attended the conference including all county CPC committees' deputy secretaries and county vice magistrates in charge of industry and communications, chairmen of all county economic committees and responsible persons of all sugar refineries. The conference noted: Due to the implementation of the policy on purchasing sugarcane since last year, our region's peasants' enthusiasm for promoting sugarcane production has been mobilized. Sugarcane production this year and next year will be higher than ever. This will lay a good foundation for opening up new prospects for our region's sugar industry. [Haikou Hainan Island Service in Mandarin 0330 GMT 27 Oct 82 HK]

CSO: 4007/58

SUCCESS OF FERTILIZER EXPERIMENTS REPORTED

Shijiazhuang HEBEI RIBAO in Chinese 18 Sep 82 p 1

[Text] Most recently this reporter learned from related departments of the province that the experimental application of nitrogen-phosphate compound for wheat in the Heilonggang Prefecture of the province produced obvious results. Under this year's persistent drought condition, the 450,000 mu of wheatfields in the experimental area produced a general yield increase. The average unit yield reached 251 jin/mu, 81.85 jin/mu higher than the control (no phosphate application). The yield increase was 65.3 percent.

Aiming at the problem of low and unstable wheat yield of Heilonggang Prefecture, in the autumn of last year, the centers of agricultural science and their technicians of the five areas of Longfang, Handan, Xingtain, Hengshu, and Cangzhou established the Heilonggang Prefecture Wheat Development Research Cooperative Group for joint development of a research project with the use of nitrogen-phosphate compound as the base fertilizer with wheat as the major experimental crop. This was combined with the practice of trench seeding, increasing phosphorus and reducing water, promoting the weight of the grain, using inorganic to promote organic, breeding superior varieties, and high yield cultivation on thin land to form six experimental items of demonstration. The experimental fields, a total of 450,000 mu, were placed in the 9 counties of Dacheng, Wenan, Pingxiang, Julu, Nangong, Hengshui, Zaoqiang, Qingxian, and Hejian. Through survey and study, the scientists and technicians arranged a proper ratio of nitrogen and phorphorus according to the condition of phosphorus deficiency of each plot within these experimental areas and applied the compound as the base fertilizer for the wheat crop. Results of the experiment indicate that due to high nitrogen and phosphorus deficiency, especially phosphorus deficiency of the soils of the prefecture, when the nitrogen-phosphate compound is used as the base fertilizer, the fertility of the topsoil is improved, its ratio of nitrogen and phosphorus is properly adjusted, and strong seedlings may be obtained in the seedling process. Furthermore, the nitrogen and phosphorus contents of the soil may thus promote and supplement one another to raise the benefit. Phosphorus, in particular, acts to promote the early development of the wheat root system to cause the roots to be numerous and to stretch deep into the soil so that the wheat plants develop early and the prewinter seedling become strong. The drough-resistance, cold-resistance, saline and alkaline resistance, and dry and hot wind resistance of the wheat become better also. According to the experiment, compared with nitrogen alone, the nitrogen-phosphate complex adds 1.9 secondary roots to each wheat seedling before the winter and the dry weight of the root system is four times heavier to cause the total quantity of roots to be five to six times more [sic]. During the entire growth and development period, the wheat fields were irrigated only once. In the fields applied with the compound, the roots reached down to 130 cm in depth; in the fields applied with nitrogen only, the roots only reached down to 52.5 cm. Due to the flourishing development of the wheat root system, especially the radicles, the roots can absorb the moisture of the deep layers in the soil to supply the needs of the wheat plants to reinforce the plants ability to resist calamities.

Through the experimental demonstration, the scientists and technicians believe that the fast acting phosphorus content of the soil is the key to the effectiveness of phosphorus fertilizer application. According to the experiment carried out by the Hengshui area Agricultural Science Center, when the soil contains 9 ppm of fast acting phosphorus, for the application of each jin of phosphate fertilizer, the yield increase of wheat is 2.36 jin. On the basis of this data, when the fast phosphorus content is below 5-10 ppm, 80-100 jin of standard phosphate fertilizer may be applied. When the soil fast phosphorus content is 5-10 ppm, 40-60 jin of standard phosphate fertilizer may be applied. For a higher level of yield, the quantity of application may be suitably increased further. The method of application is found to be better as a base fertilizer than as a follow-up application, as a concentrated application better than as a scattered application. An application in a 3-4 cun depth of the soil is proper.

6248
CSO: 4007/24

BRIEFS

THERMAL WATER RESOURCES--Scientists of the Research Institute of Hydrogeology and Engineering Geology of the Ministry of Geology and Minerals have carried out, from August 1979 to recently, a special subject survey and research project on the formation, distribution, and use condition of ground thermal water in Hebei Plain. The large quantity of data they have thus mastered proved that the ground thermal water resources in Hebei Plain are very rich and much can be done to develop this new source of energy. The hot water wells in Hebei Plain are distributed mainly in Xiong County, Gaoyang, Wuji, Ningjin, Xinhe, and Renqiu. Judging from the bore information the area with surface outpouring of ground thermal water may reach above 4,500 km^2. There are 150 plus wells, each producing above 100 m^3 of hot water a day. The temperature of the automatic flow water is generally above 60° C, with the highest reaching 110°C. This type of hot water is distributed at a regularity of 1,000-2,000 m in depth under the ground. Its pH is high, mostly alkaline. If it is used in cotton and wool textiles and in knitting and dyeing processes, the quality of the products may be improved. In agriculture, it may be used to build greenhouses to cultivate seedlings, vegetables, etc. This type of hot water also has good therapeutic effect on psoriasis, eczema, and arthritis. [Text] [Shijiazhuang HEBEI RIBAO in Chinese 18 Sep 82 p 1] 6248

CSO: 4007/24

CIRCULAR ISSUED ON STOPPING RECKLESS TREE CUTTING

SK071022 Harbin Heilongjiang Provincial Service in Mandarin 2200 GMT 6 Nov 82

[Excerpts] On 3 November, the Heilongjiang Provincial CPC Committee and Government issued an emergency circular to urge party committees and governments at all levels and departments concerned to conscientiously relay and implement the emergency directive of the CPC Central Committee and the State Council on forbidding reckless lumbering.

The circular urges a general inspection of forestry policy and blows against those who illegally damage forests so as to effectively halt the evil trend toward recklessly felling trees. The circular urges:

1) The party committees and people's governments at all levels and departments concerned should conscientiously relay the emergency directive of the CPC Central Committee and the State Council among the masses in order to make it known to every household and to every person.

2) We must resolutely combat the phenomenon forest destruction. The propaganda departments at all levels should closely work in cooperation with leading party and government organizations to publicize the guidelines of the emergency directive of the CPC Central Committee and the State Council. Efforts should be made to whip up public opinion so as to consciously form a fine general mood of society among the people of the province to take good care of forests.

3) We must conscientiously implement the directive of the CPC Central Committee and the State Council that CPC committees and people's governments of counties with forests should be in charge of implementing the decrees for protecting forests.

4) All localities should conscientiously organize forces of forestry, local procuratorial, public security, procuratorial and court organizations to conduct a general inspection of forestry policy throughout the province.

5) Only the forests that are designated under the state or provincial plans may be opened up. Denuding of forests not covered by any plans must be resolutely forbidden.

6) We should firmly and successfully attend to forestry, stabilize mountain and forest rights and delimit private mountainous areas in order to develop the production responsibility system in forestry.

CSO: 4007/58

BRIEFS

NATURAL RESOURCES--More than 80 scholars, specialists, scientists and technicians in the fields of garden, forestry and agriculture were invited to a symposium 29 October in Yichun Municipality, Heilongjiang Province, to discuss the issue on rationally exploiting the natural resources of the greater and lesser Xing'an mountains. The symposium participants pointed out that some 16.7 million cubic meters of timber have been grown annually in the forest areas of these mountains, but some 25 million cubic meters of timber have been felled annually. At present, the province's comprehensive timber utilization rate is 23 percent. The growth rate of trees in these mountains is only 1.08 percent. If we increase the tree growth rate to 2 percent, the contradiction between tree planting and felling will be alleviated. Wang Jinling, deputy provincial governor, attended the symposium. [Harbin Heilongjiang Provincial Service in Mandarin 1100 GMT 31 Oct 82 SK]

CSO: 4007/58

HENAN

BRIEFS

WHEAT SOWING--By 23 October, Henan Province had cultivated wheat on some 58 million mu, which was 15 million mu more than in the corresponding period last year. The province had fulfilled 90 percent of its wheat cultivation quota. The province has collected 250 million cubic meters of clay fertilizer and miscellaneous manure for wheat cultivation this year. There is an average of 4 cubic meters of clay fertilizer and miscellaneous manure for each mu. The masses have bought 1.64 million tons of nitrogenous fertilizer, which are 380,000 tons more than last year. They have bought 1.57 million tons of phosphatic fertilizer, which are 610,000 tons more than last year. On average, about 50 jin of nitrogenous fertilizer and phosphatic fertilizer has been applied on each mu of wheat. All places in the province have bought some 700 million jin of superior wheat seeds and trained 1.68 million wheat technicians, 200 percent more than last year. [HK011518 Zhengzhou Henan Provincial Service in Mandarin 1100 GMT 26 Oct 82 HK]

CSO: 4007/58

BRIEFS

HOG RAISING--By the end of August this year, Jiangsu Province had 1.3 million more hogs in stock than at the beginning of this year. The number of hogs raised by commune members account for 70 percent of the total number of marketable hogs. During the first 3 quarters of this year, the state procured more than 11.96 million hogs, topping the same period last year by 1.52 million head. During the period 909.3 million jin of pork was sold in the province, an increase of 8.58 percent over the same period last year. [Nanjing Jiangsu Provincial Service in Mandarin 2300 GMT 2 Nov 82 OW]

CSO: 4007/58

BRIEFS

TEA OIL PRODUCTION--Jiangxi Province has scored encouraging results in tea oil production since the 3d plenary session of the 11th CPC Central Committee. The 1979 output exceeded 76 million jin, topping 1978 by 60 percent and setting an all-time high record. The 1981 output topped 1980 by 61.4 percent. From 1977 to 1981 the province produced more than 300 million jin of tea oil and delivered more than 80 million jin of marketable oil to the state. The province now has some 180,000 mu of tea oil trees. [Nanchang Jiangxi Provincial Service in Mandarin 1100 GMT 30 Oct 82 OW]

CSO: 4007/58

BRIEFS

GRAIN PROCUREMENT--By 27 October, Jilin Province had put in storage 482.43 million jin of grain, a 580 percent increase over the figure for the same period of 1981. Of the grain stored, 161.27 million jin was soybeans and 164.89 million jin was paddy rice. [Changchun Jilin Provincial Service in Mandarin 1100 GMT 31 Oct 82 SK]

OIL-BEARING CROP PROCUREMENT--As of 3 November, Jilin Province had procured 384.07 million jin of oil-bearing crops, overfulfilling the 1982 oil-bearing crop procurement plan by 1.1 percent. Siping and Baicheng prefectures overfulfilled their procurement plans by 13.6 percent and 6.3 percent respectively. [Changchun Jilin Provincial Service in Mandarin 1100 GMT 5 Nov 82 SK]

CSO: 4007/58

BRIEFS

CATTLE EXPORT--The export volume of marketable cattle of Ju Ud League, Nei Monggol has been increasing year after year. Since 1978, the league has exported 26,100 head of marketable cattle to Hong Kong and Macao, earning 7.5 million yuan of foreign exchanges for the state. After the implementation of the party's economic policies for rural pastoral areas, the relevant departments of the league allocated special funds amounting to 390,000 yuan for the development of cattle raising. According to statistics, in 1981 the league exported 8,700 head of marketable cattle and in the January-July period of 1982, 6,600 head. [Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 16 Sep 82 SK]

SHEEP'S WOOL--Nei Monggol region reaped a bumper sheep's wool harvest in 1982, overfulfilling the annual state procurement target 4 months ahead of schedule. By the end of August, the region procured over 86 million jin of sheep's wool, an increase of 6.9 million jin over the 1981 figure, topping an all-time peak. During the January-August period, the fine hair sold to Beijing, Tianjin and Shanghai municipalities reached 23 million jin, up 5.8 million jin as compared with 1981. [SK180033 Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 16 Sep 82 SK]

BEET OUTPUT--Nei Monggol region sowed over 1 million mu of beets this year. It is estimated that total beet output will surpass 1 million jin, up 20 percent over the previous record. Bayannur and Ju Ud leagues sowed 570,000 mu of beets this year. In addition, 87 percent of beet seedlings are kept in full stand and sugar content will be higher than that in 1981. [SK192314 Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 18 Sep 82 SK]

BEET HARVEST--This year Bayannur League in Nei Monggol Autonomous Region reaped a bumper sugar beet harvest. According to statistics, the league's total sugar beet output this year is expected to reach 1 billion jin. The average per-mu yield showed an increase of 20 percent over 1981. [SK300243 Hohhot Nei Monggol Regional Service in Mandarin 1100 GMT 26 Oct 82 SK]

CSO: 4007/58

NINGXIA

AUTONOMOUS REGION INCREASE IN SUMMER GRAIN REPORTED

Yinchuan NINGXIA RIBAO in Chinese 18 Sep 82 p 1

[Text] This year the total summer grain production of the region reached 12.5 billion jin, an increase of 12.5 percent over last year's bountiful harvest. The wheat yield of areas irrigated by the water of Huanghe was a great deal higher, with a total production of 1.08 billion jin, an increase of 20.9 percent over that of last year. Due to a particularly severe natural calamity, the summer grain production of the mountainous areas was 17.7 percent less than the year before.

This year, the rural villages and the state-operated farms of the autonomous region implemented the post-Third Party Congress line, policy, and goal still further. The system of production responsibility was increasingly completed and perfected. Productive enthusiasm of farmers and state-operated farm workers was unprecedentedly high. The party organizations of all ranks took advantage of the situation and provided favorable guidance to help the cadres resolve the relationship between unity [unified leadership or planning] and responsibility [production guarantees.] Productive enthusiasm of the masses was encouraged while the merits of collective economy were also promoted. Meanwhile, the leaders and the agricultural technology departments also adopted various ways, geared to the new condition of the rural villages following the practice of the production responsibility system to carry out the work of extending agricultural sciences and technology. In all the counties of the Huanghe irrigation district, the acreage of superior breed wheat was greater than the year before and such techniques as timely seeding of proper amount of seeds, reasonable fertilizer application, timely irrigation, serious pest and disease control, and intensive field management were accomplished. In addition, the weather was relatively satisfactory to result in the great increase of unit yield. With the 53,000 mu additional summer grain acreage, the output of all the 11 counties (suburbs) was larger than that of the previous year. Of these counties, the yield increase of Yongning, Helan, Taole, Zhongwei, and Qingtongxia and the suburbs of Yinchuan City was more than 20 percent and that of Pingluo County exactly 20 percent. The yield of the suburbs of Shizuishan City and Zhongning County was more than 15 percent. The output increase of all the remaining counties was also more than 10 percent. At present, the cadres, commune members, and employees of the state-operated farms of the Huanghe irrigation district of the autonomous region are delighted with the great harvest of summer grains and are struggling for obtaining bountiful harvests all through the year. In the mountainous areas, the work of fighting natural disasters is proceeding in earnest.

6248
CSO: 4007/24

CONFERENCE ON WINTER AGRICULTURAL PRODUCTION

HK080920 Xian Shaanxi Provincial Service in Mandarin 0500 GMT 7 Nov 82

[Text] Yesterday evening, the Shaanxi Provincial CPC Committee and the Provincial Government held a telephone conference on winter agricultural production and rat extermination. In his speech, Vice Governor Bai Jinian pointed out: At present, the central work of the rural areas in our province is that we must regard the spirit of the 12th party congress as the impetus and, while perfecting and promoting the agricultural production responsibility system, vigorously do well in grasping farmland capital construction and winter crop field management.

Bai Jinian said: With a view to further improving conditions for agricultural production and ensuring that grain output in the sixth 5-year plan period will exceed 20 billion jin and the average per capita output of grain by the end of this century will amount to 1,000 jin, farmland capital construction at present and in certain years in the future is a central task and we must persist in embarking on it for a long time. He demanded:

1. We must fully mobilize the masses; leaders must personally assume command; and tasks must be done and responsibility shouldered at all levels to ensure that over 30 percent of the labor force will take part in farmland capital construction.

2. In light of the different situations of various places, we must define the main direction of attack in each place. Sanyuan County must mainly harness small basins in connection with planting trees, growing grass and developing forage grass fields. At the same time, it must do well in developing drinking water projects for both human and livestock consumption. Irrigated areas must stress developing square fields with a network of forests and regard the irrigation conveyance system as the key point. We must step up repairs in areas seriously damaged by floods.

3. To suit changes in the forms of the production responsibility system, we must take such measures as are suitable to local conditions and have flexible and varied organizations and measures. Some places can implement the system of attending to farmwork while others can implement the system of assuming full responsibility for task completion or the system of

contract. Other places can also implement the cooperation system. However, we can by no means pursue equalitarianism or indiscriminately transfer resources.

4. We must resolutely implement the provincial government's circular and order on the strict prohibition of the sabotage of water conservation and water and soil conservation facilities.

Comrade Bai Jinian also demanded: At the same time, all places must step up winter crop field management and rat extermination. Responsible comrades of Liquan and Yanchang counties introduced their experiences in carrying out farmland capital construction. Comrade Yu Mingtao, Provincial CPC Committee secretary and governor, presided over the telephone conference.

CSO: 4007/58

BRIEFS

TANGERINE OUTPUT CONFERENCE--A conference of 12 provinces and municipalities--Gansu, Sichuan, Henan, Jiangxi, Hunan, Hubei, Anhui, Shanghai, Beijing, Zhejiang, Guizhou and Shaanxi--on tangerine production was recently held in Hanzhong, Shaanxi Province. Approximately 100 workers attended who are engaged in scientific research on and production of tangerines. They held that if we can select drought-resistant and superior quality tangerine varieties and pay attention to raising the level of scientific management, we can increase our output of tangerines. [Xian Shaanxi Provincial Service in Mandarin 0500 GMT 22 Oct 82 HK]

MEANS OF PRODUCTION--From January to September this year, the amount of money which peasants in Shaanxi Province spent on means of production amounted to 650 million yuan and was 16.5 percent more than in the corresponding period last year. They bought 1.01 million tons of chemical fertilizers, which was 27.5 percent more than in the same period last year; 722 large tractors, an increase of 50.7 percent; some 9,300 3-wheeled, motorized carts, an increase of 120 percent; and some 18 million medium-sized and small agricultural tools, an increase of some 10 percent. [Xian Shaanxi Provincial Service in Mandarin 0500 GMT 26 Oct 82 HK]

CSO: 4007/58

MASSES REASSURED ON AGRICULTURAL POLICY

SK080704 Jinan Shandong Provincial Service in Mandarin 2300 GMT 7 Nov 82

[Text] In publicizing the 12th congress documents, the Yidu County broadcast station has seized on the subject about which the peasants care most and stressed it as the main point. An investigative report conducted by the station before the 12th congress revealed that the issue about which the broad masses of commune members and grassroots cadres care most is whether the party's policy will change. To help them clarify the point at issue, the county broadcast station repeatedly beamed the portion of Comrade Hu Yaobang's report dealing with persistently implementing the agricultural production responsibility system on a long-term basis and gradually perfecting it. The station also broadcast many programs on supplementary lectures on studying the 12th congress documents and stabilizing and perfecting the production responsibility system. It also broadcast many articles by commune members and cadres on their study and understanding of the 12th congress documents in programs devoted exclusively to the study of the 12th congress documents, giving wide publicity to those examples of achieving prosperity through hard work and to units and individuals distinguished in promoting the spiritual civilization. Peasants in the county are, one after another, buying the means of production. In the past month the peasants have purchased 1,500 draft animals and 1,300 diesel engines, electrical machines and water pumps. Sales of cake fertilizer and chemical fertilizer have also increased markedly.

CSO: 4007/58

DEZHOU PREFECTURE READJUSTS CROP DISTRIBUTION

Beijing BEIJING RIBAO in Chinese 23 Sep 82 p 4

[Text] XINHUA Editors Note: The experience of realizing rapid yield increases of both grain and cotton in Dezhou Prefecture of Shandong Province is a new inspiration for us all. It presents us with a scientific attitude of persistent struggle in a realistic manner, with unshakable faith to march steadily forward. Under the guidance of the 12 great spirits the leaders of the party are guiding the masses of people to stride in vigorous steps up the terrace to reach the height of Taishan. In this manner, our goal of creating the new situation of socialist modernization construction will definitely be accomplished.

The Dezhou Prefecture of Shandong Province made reasonable adjustment in its crop arrangement. Attention was given to the merit of developing cotton production and at the same time, grain production was not neglected. In this manner, yield increases of both grain and cotton were achieved. Compared with 1978, the cotton acreage of the prefecture last year was 2.63 million mu larger to produce a total increase of cotton production of 3 million dan, an increase of more than 7-fold. The grain acreage was decreased 1.41 million mu, while the total grain production remained 390 million jin higher, an increase of 13.1 percent. The total production of summer grain of the prefecture this year was more than 300 million jin above that of the previous year, an increase of 20 plus percent. Cadres and members said happily that "Grasp the gold (grain), push the silver (cotton) up, life is getting more and more delightful."

Dezhou is an old cotton-producing area. After the Third Plenary Session of the 11th Party Congress, the crop arrangement has been readjusted to restore some cottonfields squeezed out by grain crops during previous years. With increased production of cotton, more and more cotton was sold to the state and the incomes of the collectives and the members increased year after year. Under this condition, the trend of contracting the grain acreage began to appear in some areas. The CPC of Dezhou and the executive office cooly analyzed the situation. They believed that Dezhou had a farming population of 5 million and the problem of food just could not be resolved on the basis of state supplies. Grain and cotton production just had to be taken into equal consideration to make a reasonable arrangement and to struggle for yield increases of both. Originally, Dezhou Prefecture planned an expanded cotton acreage of 170,000 mu. After the leadership was strengthened, the cotton production plan was readjusted realistically to 700,000 mu only, to increase 100,000 mu of grain acreage.

Dezhou Prefecture has a great deal of wasteland and alkalized land. In the process of expanding the cotton acreage, as much as possible they developed and used the waste and alkalized lands so as not to take over grainfields. In order to resolve the land competition between grain and cotton, wherever the condition permitted intercropping wheat and cotton was also actively extended in the prefecture. After the grain acreage was reduce, in order to guarantee grain production increase, Dezhou Prefecture adopted the method of using grain to guarantee cotton production and using cotton to promote grain production so as to guarantee yield increased of both grain and cotton. In these few years, cotton production was quickly established to increase the income of cotton farmers. The Dezhou Prefecture Committee and the executive office directed and organized the cotton farmers in a timely manner to transfer the bumper cotton harvest into a large quantity of chemical fertilizer, residue cake fertilizer, and capital to be invested in grain production. As the agricultural production system began to be extended, many communes and brigades of this prefecture adopted the method of separate guarantees for cotton and grain and in some communes and brigades, a tendency of competing for cotton contracts and unwillingness to take on grain contracts appeared for a while. The prefecture extended in a timely manner the method of mixing cotton and grain contracts by individual workers or households, effectively to insure the implementation of the grain production responsibility system. Last year, in the prefecture the per capita grain consumption was 670 jin and the per capita grain production was 446 jin. With the added grain production of the private plots, the per capita grain supply reached more than 500 jin.

After several years of readjustment, the ratio between grain acreage and cotton acreage in Dezhou Prefecture this year was 55:45. The prefecture committee and the executive office believe that the present ratio of grain and cotton has become reasonable and they have asked all areas to stabilize it on this basis. In the future, the traditional yield increase experience of the masses should emphatically be united with modern scientific technologies to strive for increasing the unit yield and to struggle for continuous yield increases of grain and cotton.

6248
CSO: 4007/24

SOIL CONSERVATION WORK CONFERENCE ENDS 4 NOVEMBER

SK050956 Jinan Shandong Provincial Service in Mandarin 2300 GMT 4 Nov 82

[Text] The Provincial Water and Soil Conservation Work Conference concluded on 4 November. It pointed out that our province's water and soil conservation work is very arduous. Efforts must be made to control soil erosion as soon as possible and to do a good job on construction in mountainous areas in order to expedite the province's agricultural development. The conference was attended by responsible persons in charge of agricultural water conservancy work of various prefectures, municipalities and some counties, responsible persons of departments concerned, scientific research units as well as experts and professors of colleges and universities.

The conference noted that the water and soil conservation task of our province is very difficult. There are still 23,000 square kilometers of eroded areas in hilly sections that urgently need improvement. Of the initial 20,000 square kilometers of lands that have been improved, some have been damaged again. Those that have not been damaged again also need further improvement. The task of planting trees and grass to prevent windstorms and to immobilize shifting sands is still arduous for the province's 16,000 square kilometers of plains and windy and sandy areas. Therefore, controlling soil erosion as soon as possible, protecting water and soil resources, creating a good environment for production is of great significance in building mountainous areas, expediting the province's agricultural production and creating a new situation in all fields of socialist modernization.

The meeting urged all localities to take the guidelines of the 12th party congress as a guide, implement the guidelines of the fourth national water and soil conservation work conference, adhere to the principle regarding the work of water and soil conservation formulated by the State Council, which urges efforts to pay equal attention to preventing and tackling problems, to combine problem-tackling work with management, to suit measures to local conditions, to map out overall plans, to tackle problems comprehensively and to [words indistinct]. The meeting also urged efforts to continuously implement the guidelines of the provincial work conference on building mountainous areas. In carrying out water and soil conservation work in the days to come, we must lay stress on the following three points:

1. Actively improve vegetation. Prior to 1990, efforts must be made to plant trees on all lands that can be afforested and to plant grass in all places that need grasslands. Plains, and windy and sandy areas must complete the afforestation and grass-planting work 3 to 5 years prior to 1990.

2. Terraced fields must be built in mountainous areas so as to attain the demands of conserving water, soil and soil fertility.

3. Actively build projects to stop drifting sands from shifting into water areas.

In short, we must grasp the key points, tackle problems concerning water and soil conservation comprehensively, concentratedly and continuously and strive to basically control the province's soil erosion by the end of this century.

The conference stressed: The key to doing a good job in water and soil conservation work lies in leadership. Leaders at all levels must attach importance to the guiding principle, pay due attention to water and soil conservation work and grasp this work on a long-term basis and with good results. Efforts must be made to implement the regulations regarding water and soil conservation formulated by the State Council, map out good water and soil conservation work plans, do a good job in conducting scientific research and technical training work, arouse the enthusiasm of all quarters and upgrade the work on conserving water and soil in a down-to-earth manner.

CSO: 4007/58

SHANDONG

BRIEFS

MECHANIZED FARMING--Various localities of Shandong Province have called in the service of farm machinery to accelerate autumn sowing. As of early October, 336,000 tilling and harrowing machines and 39,000 sowing machines had been utilized. Of the total farmland, 74 percent were tractor-plowed and 46 percent tractor-sown. [Jinan Shandong Provincial Service in Mandarin 2300 GMT 26 Oct 82 SK]

WHEAT SOWING--By 27 October, Shandong Province had sowed 55.6 million mu of wheat, overfulfilling this year's autumn wheat sowing task. Linyi Prefecture had sowed 7.75 million mu of wheat by 27 October, overfulfilling plan by 1.2 million mu. [Jinan Shandong Provincial Service in Mandarin 2300 GMT 27 Oct 82 SK]

WHEAT PLANTING--Jinan, 25 Oct (XINHUA)--Shandong, a major wheat area in China, has basically completed this year's autumn wheat sowing task. By 20 October, the province had planted 54 million mu, an increase of 3 million mu over the same period last year. Wheat sowing is continuing in many prefectures which try to expand their wheat area. The province's total wheat area is expected to reach 55 million mu this year. [Beijing XINHUA Domestic Service in Chinese 1154 GMT 25 Nov 82 OW]

CSO: 4007/58

BRIEFS

DIVERSIFIED ECONOMY—Shanghai's foreign trade departments have vigorously supported the suburban counties in developing diversified economy and increasing production to expand exports. This year, total volume of products from diversified economy procured by foreign trade departments reached 350 million yuan, which is 3 1/2 times the 1977 figure. These products will bring in more than $120 million in terms of foreign exchange and will add more than 35 million yuan to the state's revenues and profits. [Shanghai City Service in Mandarin 1130 GMT 24 Oct 82 OW]

CSO: 4007/58

MEETING ON WATER, SOIL CONSERVATION

HK100337 Taiyuan Shanxi Provincial Service in Mandarin 2300 GMT 9 Nov 82

[Summary] The Shanxi Provincial Water and Soil Conservation Committee held a provincial conference on water and soil conservation in Taiyuan from 2 to 6 November. The meeting stressed: "In creating a new situation in water and soil conservation work in the province, we must: 1) vigorously popularize the experience of having households take contract responsibility for harnessing small river basins, and 2) resolutely curb destruction of forests and grassland and the reclamation of barren slopes."

Having households undertake contract responsibility for harnessing small river basins is a new thing that has appeared in the rural areas following the institution of the comprehensive contract responsibility system and a good way of speeding up construction in the mountain areas. Xinxian Prefecture has popularized the experience of a peasant household in this respect since July. In only 2 months or so, 41,700 peasant households in the prefecture have undertaken contract responsibilities for harnessing 6,800 small river and stream basins, covering a total area of 397,000 mu. Many places throughout the province are studying this experience.

The conference pointed out: In instituting this system, it is first essential to do a good job in planning. Various flexible measures should be adopted in light of local conditions.

The conference stressed: "At present there is serious destruction of forests and grassland and reclamation of barren slopes in many places in the province. Harnessing is carried out on the one hand and destruction on the other. In some places the destruction actually exceeds the harnessing. We must resolutely curb this situation and slam on the emergency brake. If we let it go on, the province's limited [words indistinct] resources will be seriously damaged."

Many of the participants said: "Many leading cadres have not regarded destruction of forests and grassland and reclamation of barren slopes as economic crimes. They just treat it as a measure for increasing grain production. Many leading cadres even take the lead in reclaiming the barren slopes. The state has now promulgated work regulations for water and soil conservation. In the future, leadership responsibility will be investigated for any failure to enforce them."

CSO: 4007/58

PRELIMINARY SUCCESSES IN HEXAPLOID COTTON HYBRIDS REPORTED

Beijing NONGYE KEJI TONGXUN [AGRICULTURAL SCIENCE AND TECHNOLOGY NEWSLETTER] in Chinese No 9, 20 Sep 82 p 2

[Article Li Bing Lin [2621 3521 2651], Zhang Xinrun [1728 2450 3387] and Wang Yun [3769 0060], Shanxi Agricultural University: "New Progress in Interspecific Hybridization Research on Asia Cotton and G. Bickii Cotton"]

[Text] Accompanying the need for development of cotton production, people have made higher and greater demands for cotton varieties. They have desired that varieties bred be high yielding and early maturing, have high fiber quality, be resistant in amy ways, highly resistant to diseases and insect pests, and such superior properties, while at the same time having the properties of seeds without glands [5177 7555] and plants with a high gland content so that cotton products will have all-around usefulness, production costs lowered and environmental pollution reduced. Because of the shortage of cotton germ plasm resources today, it is difficult to breed species with pronounced characteristics through the use of conventional cotton growing methods. Consequently, it is necessary to expand plasm resources for cotton breeding, artificially creating more and better breeding plasm. Use of remote hybridization methods to make new combinations from beneficial genes in wild growing cotton species and genes from upland cotton currently being farmed is a major way in which to realize the foregoing objective. Since 1965 when the world's first phenol-free cotton was bred until the present time, the numerous phenol-free dotton varieties that have been bred have not been promoted to wide area cultivation because of their proneness to diseases and insect pests. In 1965 Fryxell discovered that undomesticated G. bickii cotton had the special characteristic of delayed formation of oil glands and that the seeds contained no glands; however, the boll loculi had generating cells for oil glands, but only after the seeds has sprouted did the oil glands form. During the past 10 years and more, much research in this regard has been conducted abroad in an effort to transfer this trait to cultivated upland cotton varieties, without any success whatsoever. This trait was not found among the hexaploid (ADG) cotton bred from the hybridization of upland cotton and G. bickii cotton by Molamotuo [phonetic]. By way of exploring ways to breed varieties having seeds without glands and plants with high gland content, our thought was first to transfer this trait from G. bickii cotton to A or D chromosome cotton seeds, thereafter doubling the transferred hybrid chromosomes and then conducting further study of the possibilities for transfering this trait to domesticated upland cotton hybrids. First the results of research that had been done on the hybridization of Asia cotton and G. bickii cotton was used for briefing purposes as a way in which to provide cotton breeding **workers** a reference for use.

G. bickii cotton is a wild growing creeping cotton plant that grow in central Australia, 2n = 26, its chromosomes belonging to C_4 of C group. Most recent research reports have additionally classed it as a new chromosome group G_1. The stalks and both sides of the leaves of this cotton variety are covered with fuzz (5000 - 6000 individual hairs/cm^2). Most of the leaves are rather small and ovular in shape. Ventilation and light penetration characteristics are very good Bracts are particularly small and stand out from plants, thereby reducing the contamination of cotton fiber with bract leaves that lowers cotton quality, which is a very fine trait. Plants have many branches, and have strong boll formation characteristics and a low rate of bud and boll drop; they are also early maturing drought resistant, disease and insect resistant, and fibers are fine and strong. Particularly because the seeds lack glands while the plants have a high gland content, these plants are an extremely valuable plasm resource in the breeding of cotton. Our hybridization work got underway in the school's hothouse in August 1980. Using the small black seeds of Asia cotton brought from the west as the female parent, and the wild growing G. bickii cotton as the male parent, much cross-pollinization was done during the period of vigorous flowering of plants. After removal of the male organs and artificial pollination, drops of gibberelin (GA) and methyl a-naphthyl acetate (NAA) were put inside the bracts to preserve the bolls. That year 6 zero generation hybrid seeds were obtained. Planted in early April 1981, two plants survived and began budding in July. Trait mutations were numerous and remarkable in the first generation hybrid plants. The plants looked like cedar trees and manifested the strong boll formation characteristics, the small leaves, the lack of compactness of bolls around bracts, and numerous characteristics of the male parent, while the cotton boll and numerous seed traits were close to those of the female parent (Asia cotton). Statistics derived from preliminary observation of 20 traits of the hybrids showed seven similar to the male parent's traits including color and luster of petals, and flowering characteristics. Three traits resembled those of the female parent including size of seeds and shape of bolls. There were six mutations that contained traits from both, and four other mutations. In order to enlarge the number of first generation hybrid plant colonies, we propagated 10 plants using asexual grafting, which were supplied as experimental materials for hybridization with upland cotton and for doubling of hybrid chromosomes.

A high amount of infertility existed in first generation plants resulting from the crossing of Asia cotton with G. bickii hybrid variety. After plants budded, within 2 or 3 days all the buds fell off the plants. After hormones were used to preserve the bolls (drops of gibberelin and methyl a-naphthyl acetate applied inside the bracts), though buds stopped dropping, once the cotton bolls split open, only a very small degenerate embryo was found within. Microscopic examination of pollen showed irregularities in size, most pollen being rather small and round in shape. No semicircular or short thick pollen was found. When stained with the reagent, benzidine methonaphtol (5114 0058 5143 3946 6055 1568], observation showed only 1.3 percent of the pollen to be alive, which explains why there was a high rate of infertility among male gametes in first generation hybrids, and this was the principal reason why the first generation hybrid plants did not form bolls.

In order to overcome infertility in first generation hybrids, we undertook a doubling of plant chromosomes. We used a solution of 0.2 percent cochicine and 5 percent dimethylsulfoxide at a temperature of 25°C to treat growth points on several different parts of plants for 24 hours. In April this year five bolls formed on branches whose chromosomes had been successfully doubled, and after all had been opened, 50 plump first generation seeds were obtained.

To summarize the foregoing, our research results showed that by using effective measures of sexual hybridization plus hormone treatment of matched plants of domesticated diploid Asia cotton and wild growing G. bickii, obstacles to their reproduction can be overcome and first generation hybrid seeds obtained. At the same time, by using cochicine to treat growth points on first generation plants, it is possible to restore their fertility and obtain plump F_1 generation seeds. Now we are in process of carrying out hybridization of upland cotton. The hybrids formed from corssing of Asia cotton with G. bickii cotton may supply the plasm resources needed for breeding early maturing, drought resistant, disease and insect resistant, fine fiber quality varieties that can be used in an all-around way for food, cotton, and oil.

9432
CSO: 4007/11

'WEN WEI PAO' ON HU YAOBANG'S VISIT TO LIANGSHAN

HK170421 Hong Kong WEN WEI PAO in Chinese 17 Nov 82 p 3

[Report: "Hu Yaobang Visits Liangshan, Stresses Developing Animal Husbandry"]

[Text] Chengdu--Recently, not long after the convening of the 12th CPC Congress, Hu Yaobang inspected Dukou Municipality and Liangshan Autonomous Prefecture in Sichuan Province. During his investigation of the cadres and masses in Liangshan, Hu Yaobang discovered that to change the state of affairs in Liangshan, they should exert their superiority and the development of animal husbandry should be stressed. So as to enliven their thinking and broaden their field of vision, Hu Yaobang listed large number of facts, calculated many itemized accounts and repeatedly explained from north to south and from internal to foreign the great significance of conspiciously developing animal husbandry.

Hu Yaobang said: Recently, I made some investigations in the north. The income from four dairy goats is equal to the salary of a new university graduate. 6 jin of milk is equal to 1 jin of grain. If Liangshan Prefecture can breed 6 million dairy goats, this would be equal to 1 million dairy cows. They can then produce 2 million tons of milk a year, equal to 6 million jin of grain. This is a considerably figure. Milk and meat are the staple food in many countries at present. The Henggu (Monggol), Heiwuer (Uygur) and other minority nationalities of our country also take milk and meat as their staple food, so they are sturdy and strong. Our Yi and Han nationalities should also imitate them in this respect and gradually change the composition of our diet. There are more than 6 million mu of cultivated land in Liangshan Yi Autonomous Prefecture. The area of wooded and hilly lands, grassland and water is ten times more than the area of cultivated land. Therefore, it is quite obvious that we must proceed from this practice, carry out a combination of agriculture, forestry and animal husbandry, and raise the development of animal husbandry to a more important position. We must also be aware that this is a revolution in the agricultural sphere. Only by carrying on this revolution step by step for a decade or two can we have a radical change. Otherwise, if we insist on a single product economy grasping only the grain, ignoring the development of a diversified economy and are keen on reclaiming wasteland on the hillside at 50 to 60 degree angles and trying to plant buckwheat and maize, it will be impossible to change the present situation and we will become poorer and poorer.

CSO: 4007/58

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TITLE: "On the Appropriate Period for Irradiation of Crop Zygote. II. Fertilization Process and Duration of Zygote Stage of Wheat"

SOURCE: Shijiazhuang YUANZINENG NONGYE YINGYONG [APPLICATION OF ATOMIC ENERGY IN AGRICULTURE] in Chinese No 3, 17 Sep 82 pp 1-6

TEXT OF ENGLISH ABSTRACT: The time of fusion of male and female nuclei and the duration of zygote stage after artificial pollination of different wheat varieties were studied. The purpose of this study is to find out a suitable time for irradiating the zygote in order to increase mutation rate and get more steady mutants.

Three wheat varieties were used, namely, Nong Da 139, a winter wheat, YLN 7926, a spring wheat, and YLN 7617, a wheat variety of the intermediate type. The processes of pollination through fusion of male and female nuclei to the beginning of the zygote stage are similar. They usually take 6-7 hours. But the duration of the zygote stage is different. For Nong Da 139, YLN 7617 and YLN 7926 it

[Continuation of YUANZINENG NONGYE YINGYONG No 3, 17 Sep 82 pp 1-6]

appears from the 7th to the 13 hour, from the 6th to the 11th hour, and from the 7th to the 23rd hour after pollination, and lasts 7 hours, 6 hours and 17 hours respectively. It is suggested that the duration mentioned above could be the appropriate period for irradiation of wheat zygotes.

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TITLE: "Cytological Effects of ^{60}Co Gamma Radiation on Root Tip of *Vicia faba* in Different Cell Cycles"

SOURCE: Shijiazhuang YUANZINENG NONGYE YINGYONG [APPLICATION OF ATOMIC ENERGY IN AGRICULTURE] in Chinese No 3, 17 Sep 82 pp 7-12

TEXT OF ENGLISH ABSTRACT: The sprouting seeds of *Vicia faba* were treated by ^{60}Co gamma radiation with the same dose (1850R) and the same dose rate (90R/min) at intervals of 2 hours for a whole day. Taking 1 day as a cycle, we carried out a cycle observation on the aberrations of cells.

The experimental results show that gamma radiation had an obvious inhibition effect on the mitosis of root tip cells of *Vicia faba* and there was an apparent difference in radiation sensitivity at different mitotic stages between the cells. The frequency of different types of chromosomal aberration was positively correlated with the number of total aberrations. However, irradiation at different stages of

[Continuation of YUANZINENG NONGYE YINGYONG No 3, 17 Sep 82 pp 7-12]

the cell cycle led to different results. When radiation took effect at the early S stage, the maximum chromosome aberrations amounted to 48.1 percent of the total aberrations, while in chromosome aberrations the fragments reached as much as 50 percent. When radiation took effect at the later S stage, the nuclear aberrations amounted to 86.1 percent of the total aberrations, while in nuclear aberrations the micronuclei reached as much as 82.8 percent.

Therefore, in radiation breeding attention must be paid not only to good material, proper mutagenic agents and adequate dosage, but also to appropriate stage of mitotic cycle of the sprouting seeds to be irradiated.

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TITLE: "Selection of Wheat Mutant Long Fu 5009 Resistant to Root Rot"

SOURCE: Shijiazhuang YUANZINENG NONGYE YINGYONG [APPLICATION OF ATOMIC ENERGY IN AGRICULTURE] in Chinese No 3, 17 Sep 82 pp 13-16

TEXT OF ENGLISH ABSTRACT: The dry seeds of the wheat variety "663 Red" were irradiated by ^{60}Co γ-rays and argonion lasers. The mutant strain "Long Fu 5009" was selected from the seventh generation for resistance to root rot. It produced more grain than its parent and the control variety. In inoculation experiments in 1978 and 1979 it displayed stronger resistance to root rot. As for maturity, it was not an extremely early type. The changes in awn type and glume color were not due to single gene mutation. Genes controlling the awn type and the glume color were of incomplete linkage.

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TITLE: "A Study of the Activity of Corn Root System and Its Distribution in Soil"

SOURCE: Shijiazhuang YUANZINENG NONGYE YINGYONG [APPLICATION OF ATOMIC ENERGY IN AGRICULTURE] in Chinese No 3, 17 Sep 82 pp 17-22

TEXT OF ENGLISH ABSTRACT: ^{32}P was used as the trace for investigating the activity of different corn roots and their distribution in the soil. The experimental results indicated that the corn roots arising from higher nodes (especially the aerial roots) were the main organs which absorbed the inorganic nutrients from the soil in the middle and late growing period of maize. The active sphere of the root system moved gradually downward as the growing season pushed on. A cylinder of 20 cm in diameter and 40 cm in depth, with the plant as the center, was marked to be the active region of corn roots. For the purpose of producing better yields, more attention should be paid to the aerial (brace) roots arising from higher nodes and to the extension of the rich soil layer.

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TITLE: "A Study of the Nutrition of Rice Seedlings Grown in Soilless Culture in Greenhouse"

SOURCE: Shijiazhuang YUANZINENG NONGYE YINGYONG [APPLICATION OF ATOMIC ENERGY IN AGRICULTURE] in Chinese No 3, 17 Sep 82 pp 26-32

TEXT OF ENGLISH ABSTRACT: The technology of soilless culture and the nutrition of seedlings of early rice grown in a greenhouse have been studied with ^{32}P and ^{15}N as tracers. The experimental results show that it is necessary to give light to the seedlings at the one-leaf-stage because it can promote the greening of the seedlings and enhance the quality of the seedlings. The seedlings of the soilless culture can strongly absorb external nutrients before the trifoliate stage. Hence stronger seedlings of early rice can be produced by supplying the seedling with mineral fertilizers, and good harvests can be obtained from the seedlings of the soilless culture.

9717
CSO: 4011/25

Biology

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TITLE: "Morphological Changes of the Surface of the Eggs of *Rana amurensis* During First Cleavage by Fluorescence Microscopy--Receptors of Wheat Germ Agglutinin and Soybean Agglutinin"

SOURCE: Shanghai SHIYAN SHENGWU [ACTA BIOLOGIAE EXPERIMENTALIS SINICA] in Chinese No 3, Sep 82 pp 375-381

TEXT OF ENGLISH ABSTRACT: Receptors of wheat germ agglutinin (WGA) and soybean agglutinin (SBA) are present on the denuded living egg surface of *Rana amurensis*. Before cleavage these receptors distribute evenly all over the animal pole. At the onset of cleavage, numerous bright fluorescent granules which correspond to the protrusions in the scanning electron microscope are seen on the cleavage stripe and many bright radiated rays, identified as folds, are visible on the side of the cleavage stripe. Soon after, the new membrane having much less FITC-lectin binding ability appears and divides the cleavage stripe into three bright lines. The middle one is the primitive contractile ring. During cleavage, the new membrane increases gradually. However, when the denuded eggs are immersed

[Continuation of SHIYAN SHENGWU No 3, Sep 82 pp 375-381]

in a high concentration of WGA (500 γ/ml) before cleavage, the new membrane appears only for a short time, then vanishes, leaving a black streak. These results are in line with those found in newt's eggs. In a high concentration of SBA (100 γ/ml), the new membrane is exposed continuously but on a much smaller schedule. The contractile ring initially works normally, then fails to work, and the new membrane bulges out. Finally the new membrane disappears as do those in WGA.

In a few FITC-SBA stained eggs, a large dark halo, its center often coinciding with the center of the furrow, appears quickly and persists for several minutes to more than an hour, so that it may overlap with the halos seen on the second cleavage stripes. The darker overlapping area gradually decreases and eventually disappears, while the halos on the second cleavage furrows move away. Sometimes a bright halo may be seen on the egg surface. As the halo contracts, it becomes brighter and brighter. Finally many radiated stripes and a nipple-like structure are found in the center of the halo. A few receptors, however, remain or lag behind during the contraction of the bright halo. This indicates that the receptor can become mobile or increase its moving rate under certain conditions. The increasing of fluorescence, however, does not always result from the movement of the receptor, but from the movement of the cell surface. By pushing the evenly distributed fluorescent egg surface, many brighter lines appear at the folded places. An increase in fluorescent intensity due to the fold of the egg surface is also present, as are the bright radiated rays and granules at the cleavage stripe.

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TITLE: "Callus Induction and Plant Regeneration in Dehulled Rice Seeds of the Hybrid Rice in *Oryza sativa* Subsp. *Japonica*"

SOURCE: Shanghai SHIYAN SHENGWU [ACTA BIOLOGIAE EXPERIMENTALIS SINICA] in Chinese No 3, Sep 82 pp 387-391

TEXT OF ENGLISH ABSTRACT: By using the hybrid rice material in *Oryza sativa* subsp. *Japonica*, we have studied the relationships between the different seed statuses and the efficiency of the callus induction. It is found that the results are good and the method is easy by culturing the dehulled hybrid rice seeds directly. If the seeds have germinating capacity, the induction frequency can reach 100 percent. By histological observations it is demonstrated that the callus can grow out from the hypocotyl position.

[Continuation of SHIYAN SHENGWU No 3, Sep 82 pp 387-391]

In the dehulled hybrid rice seed culture, the optimum concentration of 2, 4-D for the callus induction is 3 mg/l.

There are close relationships between the age of the callus and the frequency of the green plantlet differentiation. In general, the optimum age is 15 days old.

9717
CSO: 4011/18

AUTHOR: ZHU Jifan [2612 3444 0416]

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TITLE: "New Strategy of Forestry Development in China"

SOURCE: Nanjing NANJING LINCHAN GONGYE XUEYUAN XUEBAO [JOURNAL OF NANJING TECHNOLOGICAL COLLEGE OF FOREST PRODUCTS] in Chinese No 3, Sep 82 pp 1-4

TEXT OF ENGLISH ABSTRACT: According to the speech "Situation in Forestry and Our Task" delivered on 28 Oct 1981, then the Minister of Forestry, this article probes into the major points of the new strategy of the forestry development in China. 1) Forestry work should be focused on afforestation, forest protection and greening the country. This is the essence of the new strategy. In the past, the forestry work was unduly centered on timber production, which resulted in severe ecological disasters. Under such circumstances, strategical shift is something imperative. 2) The foundation of forestry theory and ideological basis of the new strategy is to recognize, according to the laws of economy as well as the law of nature, the important role of the forest in an all-around way. Needless to say, the forest can provide timber and various kinds of forest products, but what is more important is the fact that it has multiple functions and offers multiple benefits. 3) In the past, due to the influence of the erroneous "left" ideology, the enthusiasm of the peasants was dampened, thus resulting in such damage as low survival rate of

[Continuation of NANJING LINCHAN GONGYE XUEYUAN XUEBAO No 3, Sep 82 pp 1-4]

seedlings in afforestation. Therefore, we must now apply the party's policy to emancipate the minds of the peasants and bring out their initiative. 4) Backwardness in forestry science and technology is the chief cause hindering the production of forestry. To solve this problem, great efforts must be made to raise the level of forestry science and technology, advocate scientific management and popularize forestry education. Only in this way can forestry development be speeded up.

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TITLE: "A Preliminary Study of the Characteristics of Agricultural Systems Engineering"

SOURCE: Nanjing NANJING LINCHAN GONGYE XUEYUAN XUEBAO [JOURNAL OF NANJING TECHNOLOGICAL COLLEGE OF FOREST PRODUCTS] in Chinese No 3, Sep 82 pp 39-45

TEXT OF ENGLISH ABSTRACT: 1. Agricultural systems engineering is the application of systems engineering to the management of macro-agriculture, a modern technique in the organization and administration of the movement of macro-agriculture economics and of the productive activities of micro-agriculture.
2. Agricultural systems engineering is a branch of systems science, whose main objects of study are the logic, information and program in the field of agriculture, belonging to the category of "soft" science.
3. Apart from the common basic theories for systems engineering, such as operations research and computer science, agricultural systems engineering has its own specific basic theory, i.e., farming science, which studies the laws of conducting macro-agricultural production.
4. The objective of agricultural systems engineering is to speed up macro-agricultural production so that more material wealth can be created and to

[Continuation of NANJING LINCHAN GONGYE XUEYUAN XUEBAO No 3, Sep 82 pp 39-45]

improve the systems of nature in order to create a desirable, reasonable and highly efficient ecological system.
5. Viewed from the standpoint of systems science, macro-agricultural production system has characteristics with complex mechanisms, i.e., regionalism, periodicity, comprehensiveness, systematism, orderliness and being subject to chain reactions. In conducting agricultural production, one should bear in mind all these characteristics and the actual conditions of the specific locality and time, analyze the contradictions and coordinate relevant links and factors, going forward step by step in dynamic equilibrium.

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TITLE: "Studies on the Relationship Between Soil Moisture and Tree Growth in a Pine Forest Ecosystem in Nanjing"

SOURCE: Nanjing NANJING LINCHAN GONGYE XUEYUAN XUEBAO [JOURNAL OF NANJING TECHNOLOGICAL COLLEGE OF FOREST PRODUCTS] in Chinese No 3, Sep 82 pp 97-108

TEXT OF ENGLISH ABSTRACT: The pine forest ecosystem we have studied is situated at the purple mountain not far from Dr Sun Yat-sen's mausoleum, Nanjing, Jiangsu Province. Masson's pine trees (Pinus Massoniana Lamb.) constitute more than 80 percent of the total composition of the pine stand, are 12-14 years old, with a canopy density of 0.7, stand density of 120 trees/mu (or 1800 trees/ha), [illegible] height 5.5 m, and average breast-height diameter 11 cm. The undergrowth is [illegible] intolerant grasses, 60-100 cm high, with a coverage of 40-50 percent. The soil is yellow brown earth, heavy loam to clay.

A formula for the moisture equilibrium in forest soil has been suggested in this paper to study the variations of soil moisture and their effects on tree growth. The main conclusions we arrived at are as follows:

The annual variations of soil moisture in a pine stand can be divided into four

[Continuation of NANJING LINCHAN GONGYE XUEYUAN XUEBAO No 3, Sep 82 pp 97-108]

phases in Nanjing region. During the phase from April to June, when the water supply is most important for tree growth, soil moisture is fairly sufficient, although a little uncertain at times.

There is no significant variation of soil moisture beneath 20 cm of the ground. Soil moisture there is much more stable than that at the layer above. So if we adopt some measures to make the roots of the trees penetrate deeper into the soil layers, they will absorb more water and grow better.

The height growth of trees and the growth of early wood and late wood are closely related to the hydrothermal coefficient of climate and the available water. In the April-June phase, the multiple correlation coefficient of the average height growth of trees to the hydrothermal coefficient of climate and the capacity of available is 0.962, and that of early wood growth of trees to those is 0.947. In the July to September phase, such a multiple correlation coefficient of late wood growth to those is 0.851. With the analyses of the correlations, it is possible to use the hydrothermal coefficient, especially together with the available water supply in soil, to predict the growth of the stand.

The pine stand can make the soil desiccative during the growing season and moist during the dormant season in the mountainous region in Nanjing.

9717
CSO: 4011/26

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TITLE: "Basic Method of Resolving the Problem of Aridity in Shanxi Province"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 10, 20 Oct 82 pp 2-5

ABSTRACT: In Apr and May, the author spent more than one month to visit the 20+ counties in Xishan, Pingchuan, and South Shanxi to talk with the local cadres and masses about the situation of agricultural production. The response he got was that the policy is good, the people are diligent, but all depend upon whether the weather is going to be helpful. Following a detailed observation and analysis of the problem, the author believes that it essentially involves the following: (1) The State cannot afford to invest a large amount of capital for water conservancy engineering at present; (2) The lack of water resources in the province; (3) Due to insufficient sources of water, some existing engineering structures have become ineffective; (4) The problem of aridity also involves water and soil erosion, sparse vegetative cover, uneven distribution of rainfall, and ecological imbalance. Following this analysis of the facts, the author presents in the paper a program of comprehensive treatment of the soil, the water, and the forests. The program is explained in some systematic detail, with concrete steps for its implementation. This paper originally appeared in SHANXI RIBAO 2 Aug 82.

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ORG: Breed Resources Office, Shanxi Provincial Academy of Agricultural Sciences

TITLE: "Analysis of Ecological Types of Soybean Varieties in Shanxi Province: II. Geographic Distribution of Stalk And Yield Characteristics of Soybean"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 10, 20 Oct 82 pp 11-14

ABSTRACT: In 1974 to 1980, 765 specimens were selected from 1,000 materials of farm varieties of soybean collected from 85 counties (cities) of Shanxi Province and grown for 2 years in the experimental field of the office. Based upon the classification of the author (1981) of soybean cultivars of the province into 6 ecological adaptation regions, the height of stalk, the number of branches, the number of nodes on the main stem, the height of pod formation, the ratio between grains and stem, the number of pods per stalk, the number of beans per stalk, the weight of stalk and beans, the average weight of 100 beans, the standard deviation, and the variation coefficient of the 765 specimens were analyzed. Based upon the analytical data thus obtained, the geographic distribution of the stalk characteristics and the geographic distribution of the yield characteristics are discussed separately in the paper.

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TITLE: "Relationship Between Corn Head Smut and the Planting Time"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 10, 20 Oct 82 pp 15-16

ABSTRACT: The major route of infection of the fungous disease of head smut of corn is soil. If the soil carries the disease, the temperature and humidity of the soil after seeding affect the severity of the disease. In areas of spring corn, the seeding time varies to create a variation of the soil temperature and moisture condition and hence the difference in the severity of the disease. Some scientists believe if seeding is early, the seedling stage is prolonged and there will be more opportunity for infection. Others believe the disease is milder if seeding is either early or late and the incidence of the disease is the highest if the corn is seeded at a proper time. In 1980-81, the authors carried out an experiment in the northern suburb of Taiyuan with corn of different disease resistance and different seeding times, followed by another experiment using different temperature treatments. Results indicate that seeding time has no effect on the disease-resistant varieties. With the susceptible varieties, proper early or late seeding may reduce the severity. With the highly susceptible varieties, the disease will be severe regardless of the seeding time; they should never be used.

AUTHOR: None

ORG: Bovine Breed Resources Survey Group, Shanxi Province

TITLE: "A Newly Discovered Type of Oxen-- The Pinglu Mountain Ox"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 10, 20 Oct 82 pp 17-19

ABSTRACT: In 1980-81, in the process of carrying out a survey of bovine breeds in Shanxi Province, the group discovered a new type of oxen-- the Pinglu mountain oxen. Preliminary inspection indicates that it is primarily a draft animal, with some meat producing potential. The condition of its native habitat, its distribution and formation, its morphology and size, its work capacity, its feeding and reproductive characteristics, and its shortcomings and some suggestion for its improvement are discussed. This breed has a high content of good quality and tender lean meat. Related departments are urged to breed it and to open a market for it as a meat animal.

AUTHOR: LUO Zhicheng [5012 1807 2052]

ORG: None

TITLE: "ZHAO Hongzhang [6392 3163 3864]"

SOURCE: Taiyuan SHANXI NONGYE KEXUE [SHANXI AGRICULTURAL SCIENCES] in Chinese No 10, 20 Oct 82 inside backcover

ABSTRACT: This paper is a brief biography of the wheat breeding specialist, ZHAO Hongzhang who successfully bred out in 1970 the highly adaptable, lodging resistant, Aifeng No 3, yielding more than 1000 jin/mu. He was born in 1917 in Qi County of Henan and was a graduate of the Department of Agronomy of the Northwest College of Agriculture in 1940. Disheartened by the low wheat yield of his native Guanzhong due to rust and midge, he was determined to breed disease and pest resistant varieties of wheat and produced the high yield, good quality, and rust resistant Bima No 1 in 1947, just before the liberation. He joined the Communist Party in Mar 56 and was elected to the National People's Congress twice. His major writings include: "Process of Selective Breeding of Bima No 1," "A Superior Breed of Wheat," "Several Problems in the Wheat Hybridization Work," "Shaanxi Wheat," etc. A photo of the scientist is included.

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ORG: ZENG of the Agricultural University of Yunnan; LUO, CAO and SHAN et al., all of the Kunming Institute of Zoology, Chinese Academy of Sciences

TITLE: "Karyotype Studies on Domestic Pigs in Southern China"

SOURCE: Tianjin XUMU SHOUYI XUEBAO [ACTA VETERINARIA ET ZOOTECHNICA SINICA] in Chinese No 3, Aug 82 pp 167-171

TEXT OF ENGLISH ABSTRACT: This paper presents the karyotype studies on domestic pigs in southern China. The diploid chromosomes are 2n=38 in both sexes. The X-chromosome is a metacentric chromosome and the Y is a smaller submetacentric one.

The chromosomes are measured and divided into four groups according to their relative length, arm ratio and centromere index of each chromosome. The Nos 1 to 5 of group A are submetacentric chromosomes (SM); Nos 6 and 7 of group B are subtelocentric chromosomes (ST); Nos 8 to 12 of group C are metacentric chromosomes (M) and Nos 13 to 18 of group D are telocentric chromosomes (T).

[Continuation of XUMU SHOUYI XUEBAO No 3, Aug 82 pp 167-171]

Both the G-band and C-band are described, with the G-banding pattern revealing no significant differences with that of domestic pigs so far reported. The polymorphism of the C-band may be related to the varietal differences between domestic pig breeds.

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ORG: All of the Animal Husbandry and Veterinary Medicine Research Institute, Shanghai Agricultural Academy

TITLE: "Serological Identification of Porcine Respiratory Tract Micopiasmas in China"

SOURCE: Tianjin XUMU SHOUYI XUEBAO [ACTA VETERINARIA ET ZOOTECHNICA SINICA] in Chinese No 3, Aug 82 pp 181-188

TEXT OF ENGLISH ABSTRACT: Twenty-one strains of micoplasma isolated from respiratory tracts of swine from six provinces, municipalities and autonomous regions of China were identified serologically and proved to belong to two species by the method of dry paper disc growth-inhibition test, using antisera to the Jinan strain isolated from pigs with "swine asthma" and to a mycoplasma hyorhinis-like strain L6. Twelve strains of the "swine asthma" pathogen out of the 21 isolated strains were of the same species.

The Jinan strain was proven to be identical with the type culture NCTC No 10110 of M. hyopneumoniae, and the strain L6 with the BTS7 of M. hyorhinis. The original causative agent of "swine asthma," widespread in China, was thus demonstrated to be M. hyopneumoniae.

AUTHOR: WU Shiyou [0702 2514 0645]

ORG: Institute of Animal Husbandry and Veterinary Medicine, Shandong Academy of Agricultural Sciences

TITLE: "A Study of the Pathogenesis of Experimental Escherichia Coli Enterotoxaemia of Swine"

SOURCE: Tianjin XUMU XHOUYI XUEBAO [ACTA VETERINARIA ET ZOOTECHNICA SINICA] in Chinese No 3, Aug 82 pp 189-193

TEXT OF ENGLISH ABSTRACT: Freeze-thawed lysates of hemolytic *Escherichia coli* O139 were centrifuged. The supernatant was separated into three portions by Dextran gel (sephadex G-200) chromatography. The first portion was parenterally administered to seven weaned pigs. The clinical signs and pathology of the inoculated pigs were similar to those found in other endotoxin shocks. The second portion was parenterally administered to eight weaned pigs. Their clinical signs and pathological pictures were the same as those of the naturally occurring oedema disease of pigs. Experimental *E. coli* enterotoxaemia of swine can be divided into two categories: one is the "endotoxin shock type" produced by the endotoxin and the other is the "oedema type" caused by oedema disease principle.

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et al.

ORG: All of Jiangxi Agricultural University, Nanchang

TITLE: "Determination of Serum Transferrin Phenotypes in Swine"

SOURCE: Tianjin XUMU SHOUYI XUEBAO [ACTA VETERINARIA ET ZOOTECHNICA SINICA] in Chinese No 3, Aug 82 pp 194-197

TEXT OF ENGLISH ABSTRACT: Transferrin phenotypes have been detected in all domestic animals examined so far. Various investigations abroad have indicated some relationship between transferrin phenotype and reproductive performance in pigs, cattle and sheep. In order to explore such a relationship in Chinese pigs and to apply it to the selection and breeding of swine, the phenotypes of serum transferrin were examined in 217 samples from Ganzhou White pigs of Jiangxi Province by the starch gel electrophoresis technique. Protein in 180 samples occurred in various molecular forms exhibiting multiple band patterns on the stained gel after electrophoresis. According to Michael's work in which transferrin phenotypes were identified in starch gel electrophoresis by autoradiography with Fe^{59}, the locations of the bands were determined by electrophoresis relative

[Continuation of XUMU SHOUYI XUEBAO No 3, Aug 82 pp 194-197]

mobility. Six transferrin phenotypes (AA, BB, CC, AB, AC and BC) were separated in the Ganzhou White. The gene frequency of T_fBB was the highest among the breeds (including Yorkshire and Taiwan native swine) examined, while that of T_fAA was higher than that of T_fCC. The results obtained were in agreement with a genetic theory of serum protein.

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DA Shunying [4572 5293 5391]
ZHONG Xiaofen [6945 1420 5358]
et al.

ORG: All of the Anti-epidemic Station of Guangxi Zhuangzu Zizhiqu et al., Nanin, Guangxi

TITLE: "Studies on the Secretion of Aflatoxin M_1 in Cow's Milk After Aflatoxin B_1 Feeding"

SOURCE: Tianjin XUMU SHOUYI XUEBAO [ACTA VETERINARIA ET ZOOTECHNICA SINICA] in Chinese No 3, Aug 82 pp 199-204

TEXT OF ENGLISH ABSTRACT: This observation was carried out with 12 dairy cows (crossbred) which were divided into 2 groups and fed separately with a diet containing 20 and 50 ppb of Aflatoxin B_1. The secretion of Aflatoxin M_1 in milk was found to be 0.52 and 1.58 ppb (on the average) respectively. The amount of Aflatoxin M_1 secreted was significantly related to the Aflatoxin B_1 administered. The rate of conversion of Aflatoxin B_1 was calculated to be 5.75 percent and 7.01 percent respectively, and the difference was considered to be significant. After stopping administration of the diet with Aflatoxin B_1 for 5 days, no Aflatoxin M_1 was detected in milk.

[Continuation of XUMU SHOUYI XUEBAO No 3, Aug 82 pp 199-204]

It is thus suggested that the content of Aflatoxin B_1 in mixed diet should be less than 20 ppb while the content of Aflatoxin M_1 in milk should be less than 0.5 ppb.

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